

Internet Access Services: Status as of December 31, 2020

Industry Analysis Division
Office of Economics & Analytics
August 2023



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SECTION 1: OVERVIEW & HIGHLIGHTS

Introduction

This report summarizes information about Internet access connections in the United States as of December 31, 2020 as collected by FCC Form 477. For purposes of this report, Internet access *connections* are those in service, over 200 kilobits per second (kbps) in at least one direction, and reported to the FCC through Form 477.¹

The report includes data on total and residential Internet access connections by downstream and upstream speed, by technology, by geography, and over time. Section 2 of the report presents nationwide statistics, Section 3 provides state-level data, and Section 4 includes data on the subscribership differences among counties and census tracts.² In addition, Section 5 of the report includes an analysis of the correlations between subscribership ratios and various demographic measures.³ Maps depicting the number of fixed connections per 1,000 households by census tract are available online at <https://www.fcc.gov/internet-access-services-reports>.

¹ See the Technical Notes and Glossary at the end of this report for more-detailed information about the FCC Form 477 data collection and the meaning of terms used in this report.

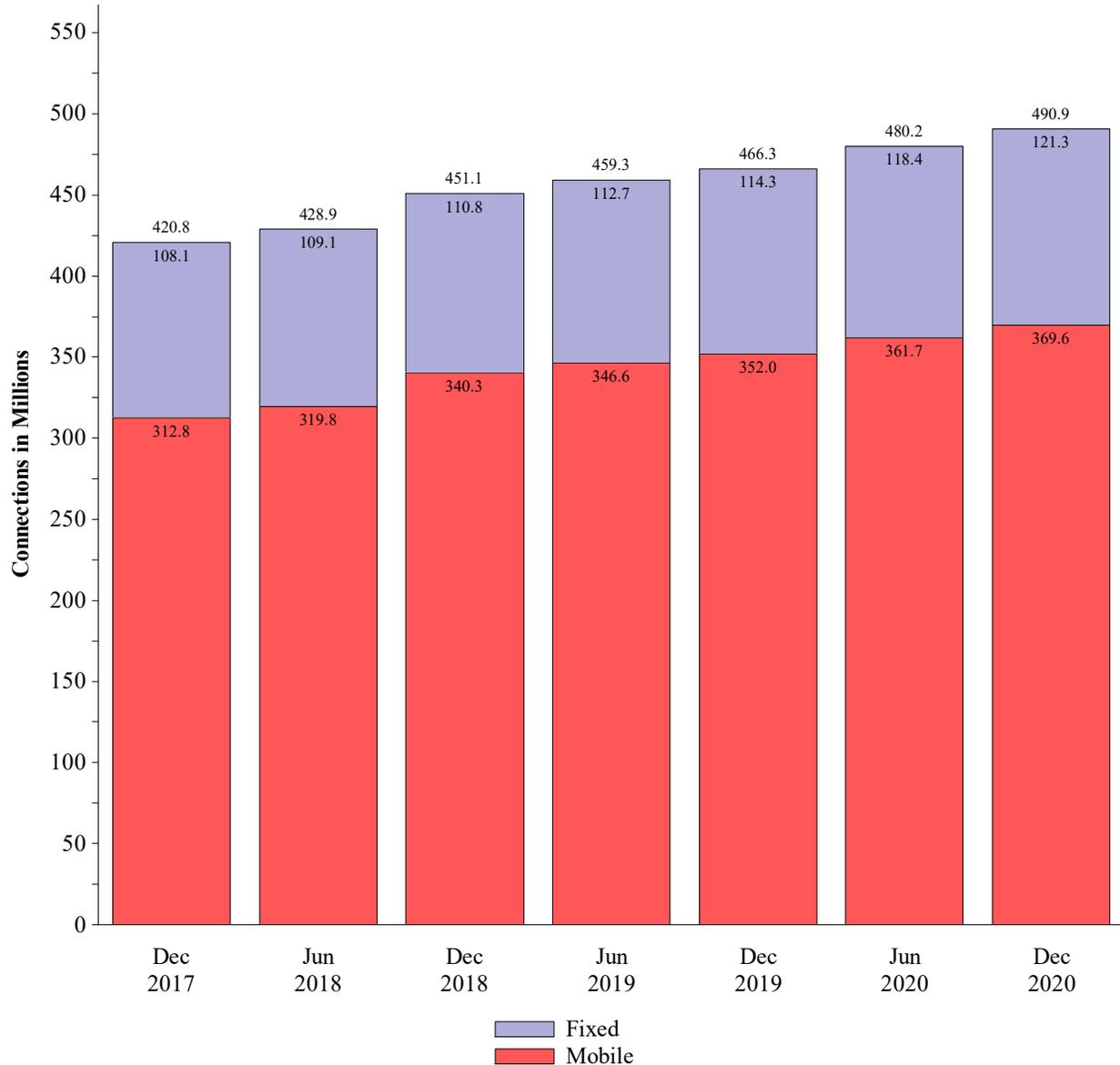
² The Commission began collecting census tract-level data for data as of December 31, 2008. *See High-Speed Services for Internet Access: Status as of December 31, 2008* (February 2010) at 1-4, available at <http://www.fcc.gov/encyclopedia/high-speed-services-internet-access-reports> (*December 2008 High-Speed Report*).

³ Publicly-available data that are too voluminous to include in this report are available online at <https://www.fcc.gov/general/fcc-form-477-additional-data>.

Total Connections

- As shown in Figure 1, total Internet connections increased by about 5.3% between December 2019 and December 2020 to 491 million. Mobile Internet connections increased 5.0% year-over-year to 370 million in December 2020, while fixed connections grew to 121 million – up about 6.1% from December 2019.

Figure 1
Fixed and Mobile Connections 2017-2020

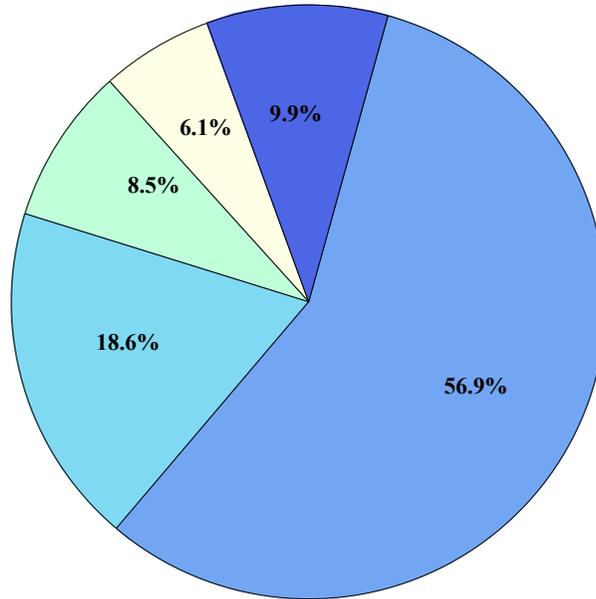


Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding. Connections include both residential and business connections. We believe mobile Internet connections remain underreported by as much as 2% through June 2018 due to inadequate accounting of connections sold by downstream mobile virtual network operators (MVNOs).
Source: FCC Form 477.

Connections by Speed

Fixed connections – downstream speeds. Figure 2(a) illustrates how the 121 million fixed connections reported for December 2020 were distributed across the five groups of *downstream speeds* defined by breakpoints at 10 Mbps, 25 Mbps, 100 Mbps, and 940 Mbps. See Figure 9 for more detail.

Figure 2(a)
Distribution of Fixed Connections (121.3 million) by Downstream Speed
as of December 31, 2020

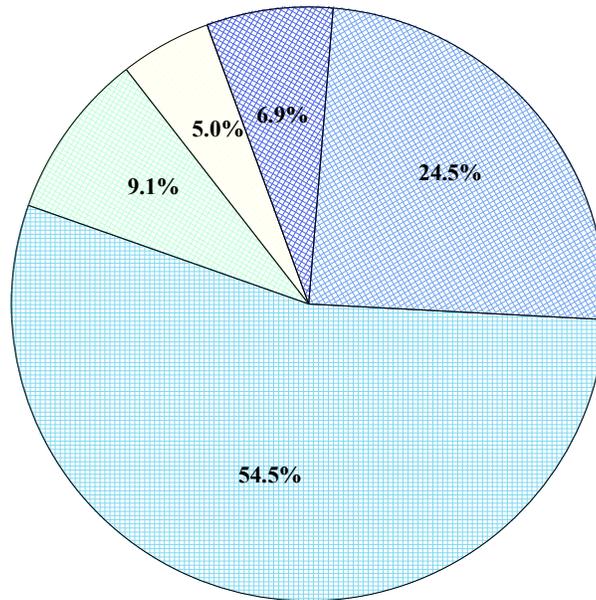


| | |
|------------------|---|
| Downstream Speed | Less than 10 Mbps (7.4 million) |
| | At least 10 Mbps & less than 25 Mbps (10.3 million) |
| | At least 25 Mbps & less than 100 Mbps (22.6 million) |
| | At least 100 Mbps & less than 940 Mbps (69.0 million) |
| | At least 940 Mbps (12.0 million) |

Note: Numbers may not sum to total due to rounding.
Source: FCC Form 477.

Fixed connections – upstream speeds. Figure 2(b) illustrates how the 121 million fixed connections reported for December 2020 were distributed across the five groups of *upstream speeds* defined by breakpoints at 1 Mbps, 3 Mbps, 20 Mbps, and 500 Mbps. See Figure 9 for more detail.

Figure 2(b)
Distribution of Fixed Connections (121.3 million) by Upstream Speed
as of December 31, 2020



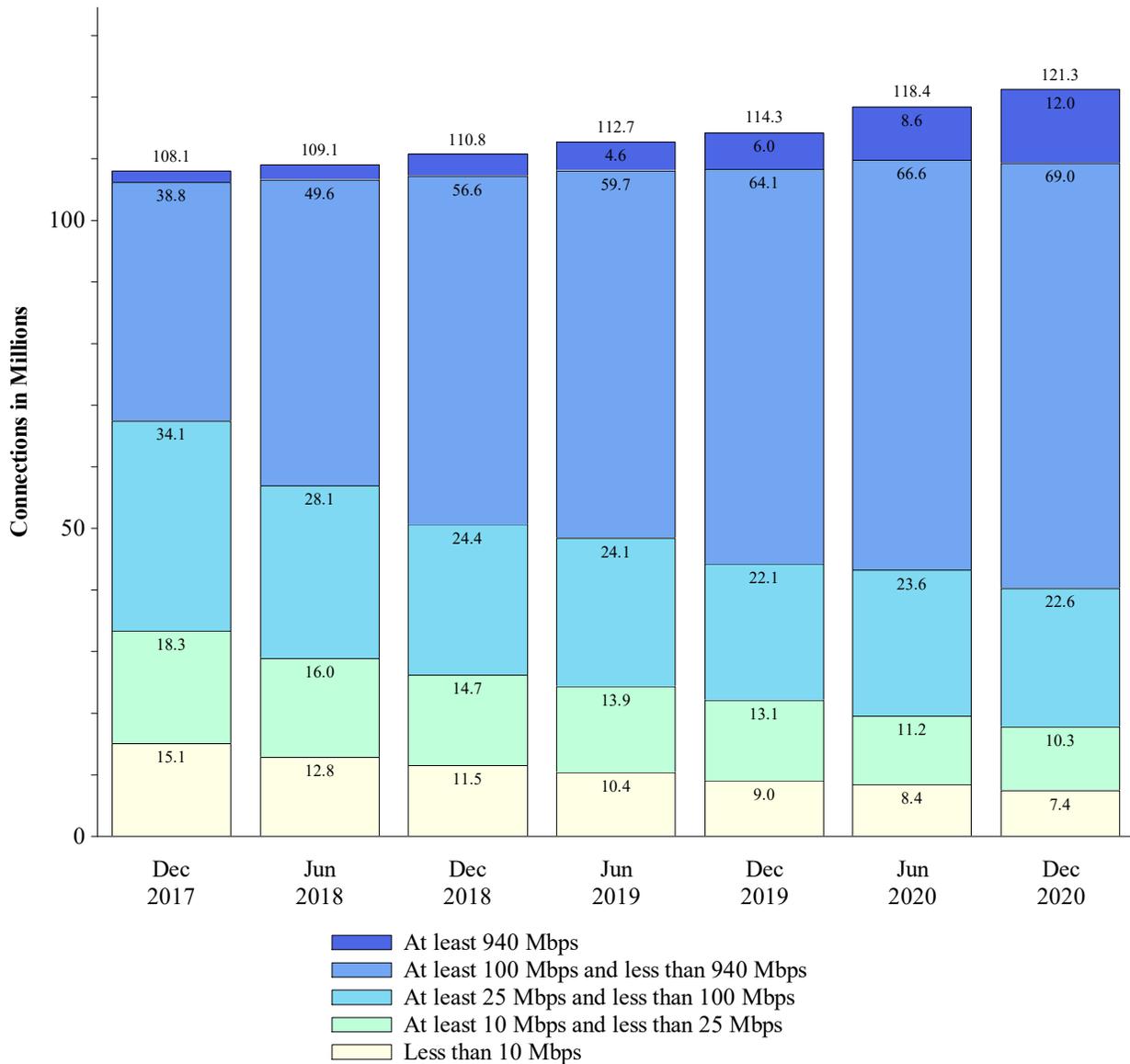
Upstream Speed

- Less than 1 Mbps (6.0 million)
- At least 1 Mbps & less than 3 Mbps (11.0 million)
- At least 3 Mbps & less than 20 Mbps (66.1 million)
- At least 20 Mbps & less than 500 Mbps (29.7 million)
- At least 500 Mbps (8.3 million)

Note: Numbers may not sum to total due to rounding.
Source: FCC Form 477.

Fixed connections by downstream speed over time. Figure 3 illustrates how the composition of total fixed Internet connections by different speed groups has changed from 2017 to 2020.

Figure 3
Fixed Connections by Downstream Speed 2017-2020



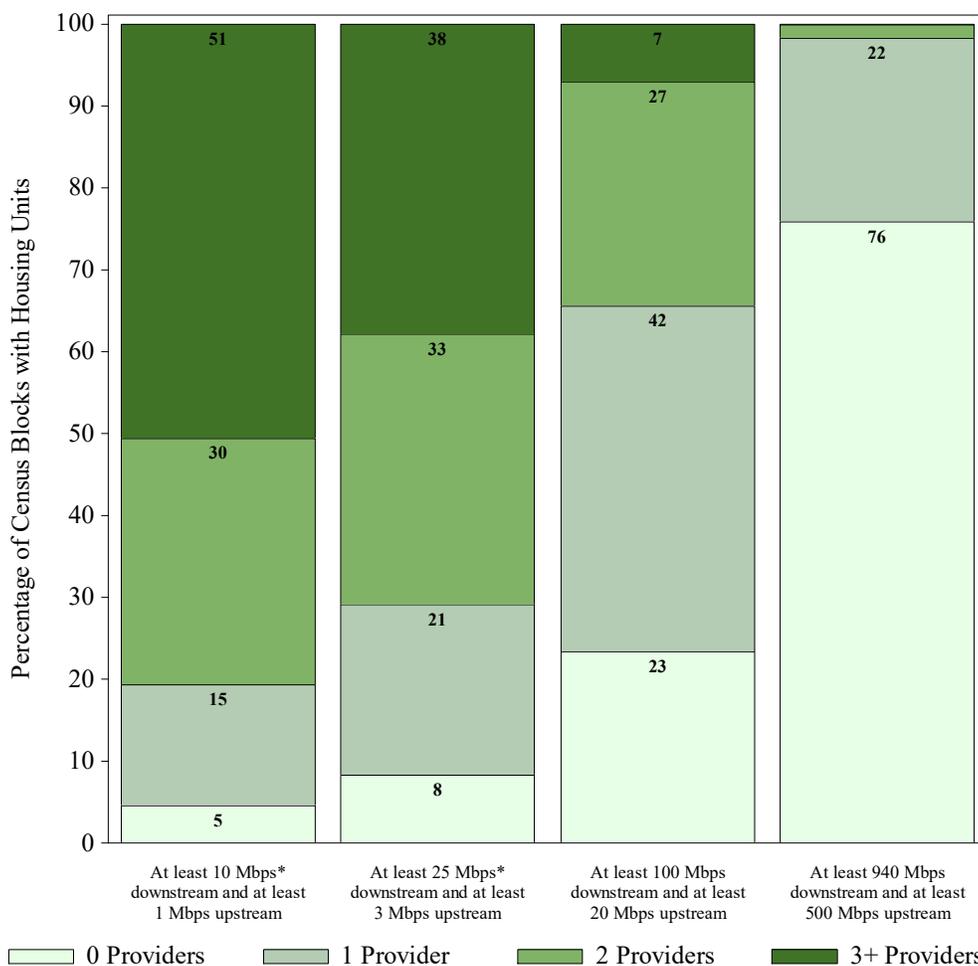
Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding. Connections include both residential and business connections.
Source: FCC Form 477.

- The percentage of fixed connections with a downstream speed of at least 100 Mbps has grown from 38% (or 41 million connections) in December 2017 to 67% (or 81 million connections) in December 2020. Over the same period, the percentage of fixed connections with downstream speeds of less than 10 Mbps has decreased from 14% (or 15 million connections) in December 2017 to about 6% (or about 7 million connections) in December 2020.

Number of Providers by Census Block

In Figure 4, we show the percentage of “developed” census blocks – blocks that contain housing units – with zero, one, two, or three or more fixed broadband providers offering residential Internet access service at different speeds in December 2020. This information is taken from the block-level FCC Form 477 fixed broadband deployment data that the Commission began collecting in 2014.⁴ A provider that reports offering service in a particular census block may not offer service, or service at that speed, to all locations in the census block. Accordingly, the number of providers shown in Figure 4 does not necessarily reflect the number of choices available to a particular household and does not purport to measure competition.

Figure 4
Percentages of Developed Census Blocks in which Providers Reported the Deployment of Residential Fixed Broadband as of December 31, 2020



* Satellite service providers are excluded from this analysis. Satellite service providers report offering internet access at bandwidths of at least 25 Mbps downstream and 3 Mbps upstream in 99.8% of developed Census blocks.

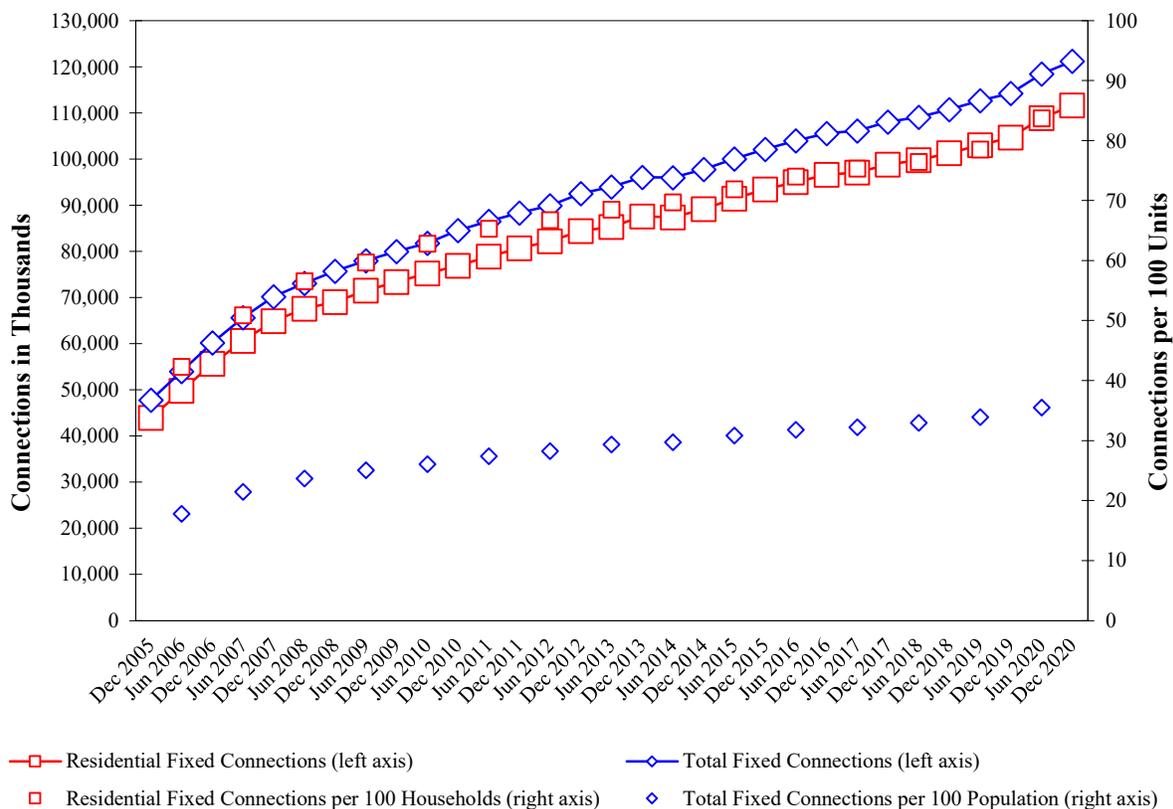
Note: Numbers may sum to totals due to rounding. Developed census blocks are those with housing units based on the 2010 census. Source: FCC Form 477.

⁴ Download these data and explore the interactive map at <https://broadband477map.fcc.gov/#/>.

Internet Access Subscribership

Figure 5 illustrates the number of total and residential fixed Internet access connections (connections over 200 kbps in at least one direction except mobile wireless connections), as well as the number of total fixed connections per 100 persons and the number of residential fixed connections per 100 households, since 2005.

Figure 5
Fixed Connections 2005-2020
(Connections over 200 kbps in at least one direction)



- Between December 2010 and December 2020, total (business and residential) fixed connections grew from 85 million connections to 121 million connections – at a compound annual growth rate of 4% per year.⁵
- Over the same ten-year period, residential fixed connections grew from 77 million connections to 112 million connections – also at a compound annual growth rate of 4% per year.

⁵ The compound annual growth rate (CAGR) is a smoothed rate of growth calculated in three steps: (1) divide the ending value by the beginning value; (2) raise the result of that division to a power equal to one divided by the number of years in the period (in this case, 10 years, so the power is 1/10); (3) subtract the number one from the result of the second step.

- From June 2010 to June 2020, the number of residential fixed connections per 100 U.S. households increased from 63 to 83.⁶

Other Report Highlights

Typical speeds

- The median downstream speed of all reported fixed connections was 115 Mbps and the median upstream speed was 10 Mbps. For residential fixed connections, the median downstream speed was 150 Mbps and the median upstream speed was 10 Mbps.

Residential connections

- Residential fixed Internet access connections increased by about 6.6% between December 2019 and December 2020, to about 112 million. *See Figure 7.*
- Residential (non-business) mobile wireless Internet access connections on mobile devices with data plans for full Internet access increased by about 4.4%, to 296 million, between December 2019 and December 2020. *See Figure 7.*
- Approximately 93% of residential fixed connections had a speed of at least 10 Mbps downstream and 1 Mbps upstream in December 2020, while 85% had a speed of at least 25 Mbps downstream and 3 Mbps upstream. About 69% percent of all residential fixed connections had a downstream speed of at least 100 Mbps. *See Figures 10 and 29.*
- As a national average in December 2020, there were about 84 residential fixed connections with speeds of at least 10 Mbps downstream and 1 Mbps upstream per 100 households; 76 residential fixed connections with speeds of at least 25 Mbps downstream and 3 Mbps upstream per 100 households; and 26 residential fixed connections with speeds of at least 100 Mbps downstream and 20 Mbps upstream per 100 households.⁷ *See Figure 34.*

⁶ We calculate residential fixed connections per 100 *households* using, in the denominator, U.S. household estimates from the Census Bureau’s Current Population Survey (CPS) for July of each year and, for Puerto Rico and the other inhabited island areas, Census 2010 households for 2010 and later years and Census 2000 households for the earlier years. (The CPS also estimates U.S. households for March and November of each year.) Figure 5 also shows total (business and residential) fixed connections per 100 *population*, which we calculate using U.S. Census Bureau population estimates for the United States and Puerto Rico – which are as of July 1 each year – and, for the remaining inhabited island areas, Census 2010 population for 2010 and later years and Census 2000 population for the earlier years. This statistic incorporates connections to business locations into a comparison to persons. (We note that the ratio of accurately-measured residential fixed connections to population has a maximum value for any given country and point in time – the value when every household is connected – if we assume that no household would have more than one fixed connection to its premises. For the United States in June, for example, the maximum value would be 40 because there were about 131 million households in the United States and inhabited insular areas and a population of about 332 million according to the sources used for Figure 5.)

⁷ Increases over time in the ratio of residential fixed connections to households indicate that increasing shares of households are connected at home. The ratio is somewhat different from the “take rate” of offered service (which may also be called an “adoption rate”) because some households may be located in areas where no fixed-location service is offered. These methodological differences are discussed in greater detail in *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*,

Census tract and county shares of households with reportable connections

- We estimate the share of households with fixed Internet access connections in individual census tracts and counties as of December 31, 2020.⁸ We continue to observe substantial variation among these estimates. *See* Figures 39 and 41.

Household subscribership rates and demographics

- The report includes charts that illustrate correlations between household subscribership rates and demographic measures. We update charts based on income, household density, education and age. The data indicate that some demographic variables are correlated with Internet access subscribership rates. *See* Figures 46-51.

Amended by the Broadband Data Improvement Act, GN Docket No.11-121, Eighth Broadband Progress Report, 27 FCC Rcd 10342, 10386, para. 94 (2012).

⁸ For both census tracts and counties, we continue to find estimates above 100% for the share of households with fixed Internet access connections. *See* p. 57 for more information.

SECTION 2
SUMMARY STATISTICS: THE NATION

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Figure 6
Connections over 200 kbps in at Least One Direction 2016-2020
(in thousands)

| <i>Technology</i> | <i>2016</i> | | <i>2017</i> | | <i>2018</i> | | <i>2019</i> | | <i>2020</i> | |
|-------------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|--|
| | <i>Dec</i> | <i>Jun</i> | <i>Dec</i> | <i>Jun</i> | <i>Dec</i> | <i>Jun</i> | <i>Dec</i> | <i>Jun</i> | <i>Dec</i> | |
| Total | 404,849 | 408,692 | 420,838 | 428,864 | 451,062 | 459,327 | 466,302 | 480,185 | 490,888 | |
| Total Fixed | 105,593 | 106,130 | 108,065 | 109,087 | 110,784 | 112,725 | 114,291 | 118,449 | 121,250 | |
| Mobile Wireless | 299,256 | 302,562 | 312,773 | 319,776 | 340,278 | 346,603 | 352,012 | 361,737 | 369,638 | |

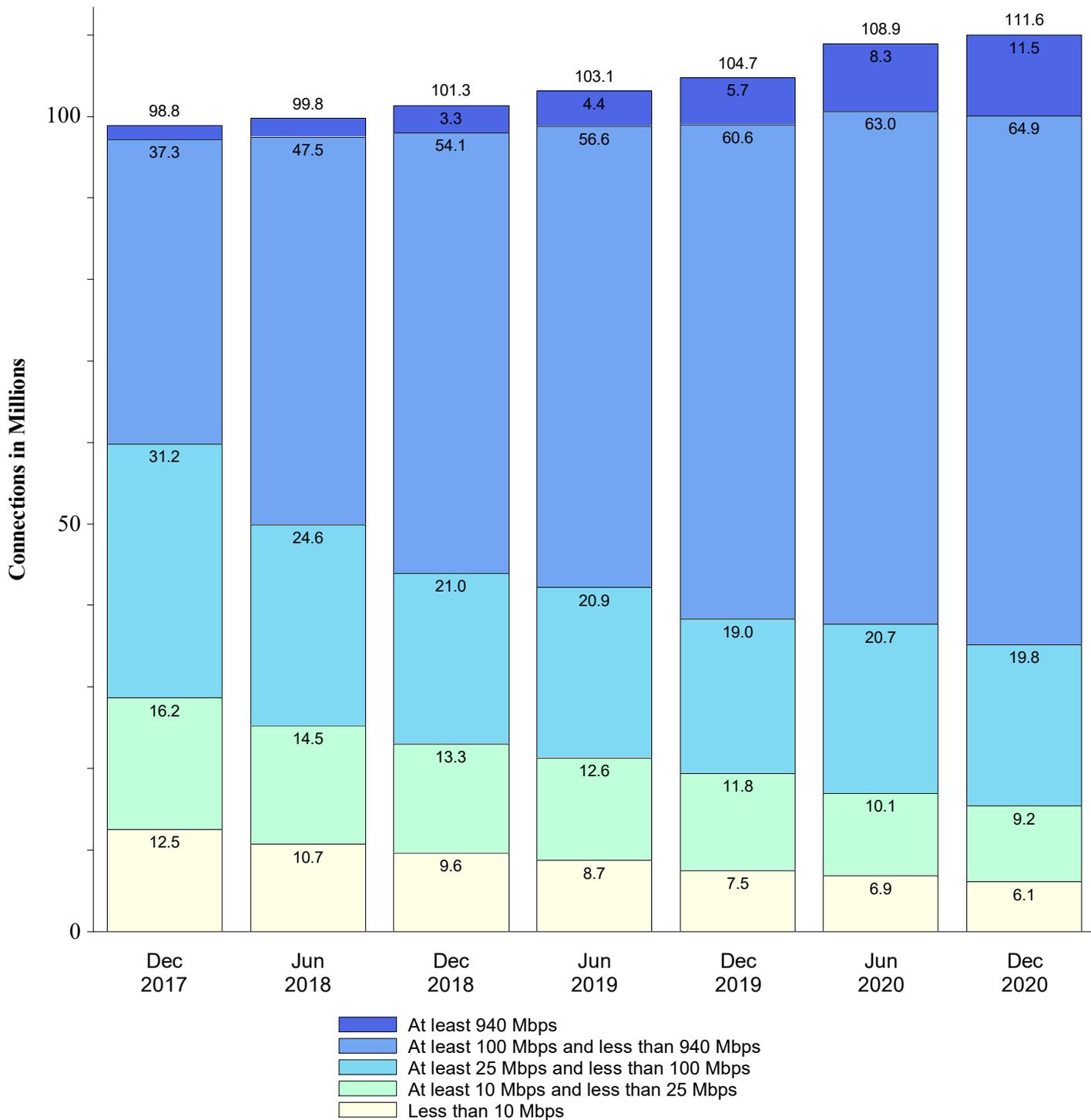
Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.
Source: FCC Form 477.

Figure 7
Residential Connections over 200 kbps in at Least One Direction 2016-2020
(in thousands)

| <i>Technology</i> | <i>2016</i> | | <i>2017</i> | | <i>2018</i> | | <i>2019</i> | | <i>2020</i> | |
|-------------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|--|
| | <i>Dec</i> | <i>Jun</i> | <i>Dec</i> | <i>Jun</i> | <i>Dec</i> | <i>Jun</i> | <i>Dec</i> | <i>Jun</i> | <i>Dec</i> | |
| Total | 337,978 | 341,094 | 351,966 | 358,867 | 378,286 | 383,605 | 388,344 | 403,212 | 407,652 | |
| Total Fixed | 96,607 | 97,071 | 98,845 | 99,758 | 101,348 | 103,118 | 104,703 | 108,909 | 111,621 | |
| Mobile Wireless | 241,371 | 244,022 | 253,121 | 259,109 | 276,938 | 280,486 | 283,641 | 294,303 | 296,031 | |

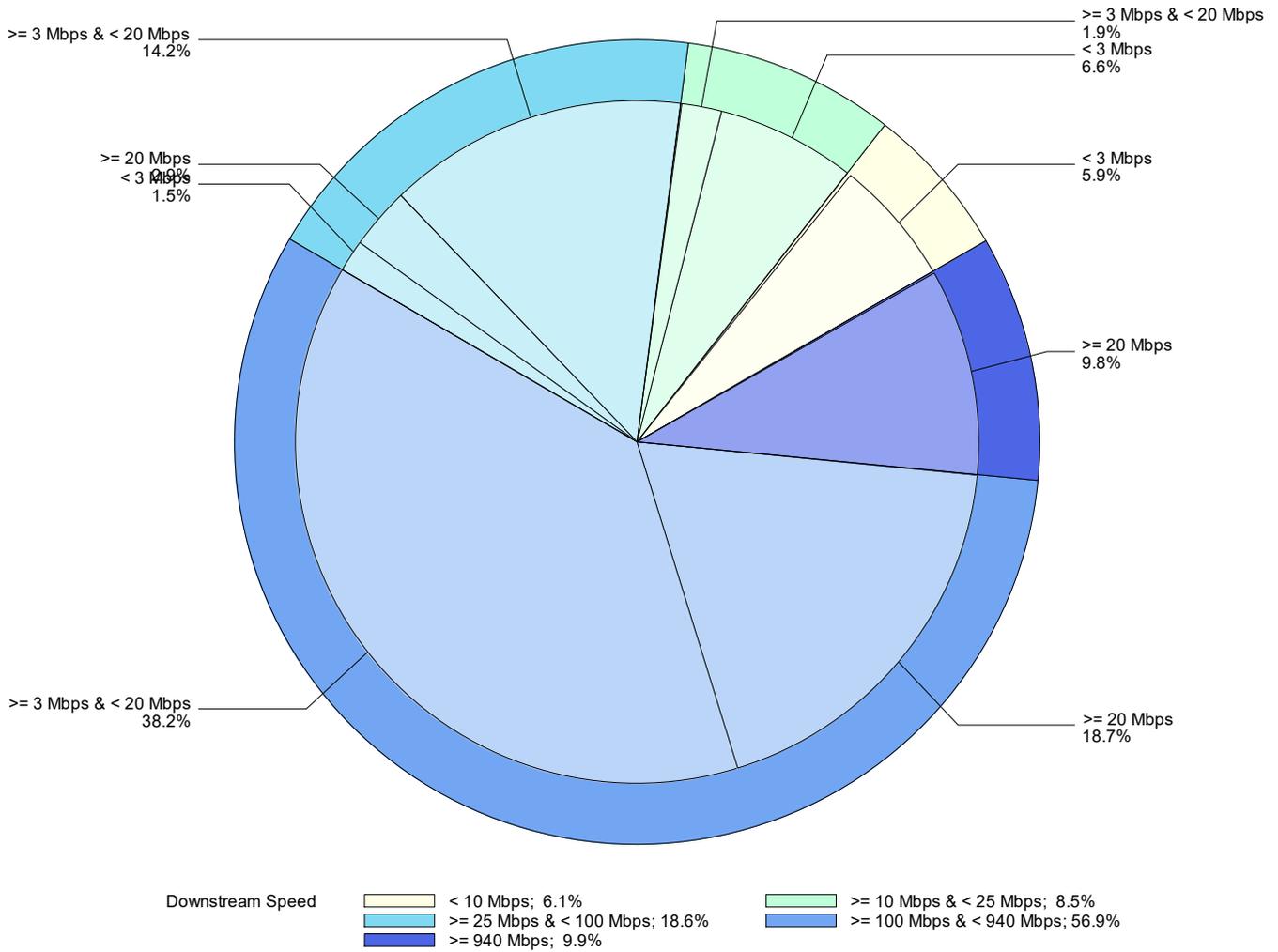
Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.
Source: FCC Form 477.

Figure 8
Residential Fixed Connections by Downstream Speed 2017-2020



Note: Numbers may not sum to totals due to rounding.
 Source: FCC Form 477.

Figure 9
Distribution of Fixed Connections over 200 kbps in at Least One Direction
as of December 31, 2020



Note: Inner circle (light shading) represents upstream speeds.

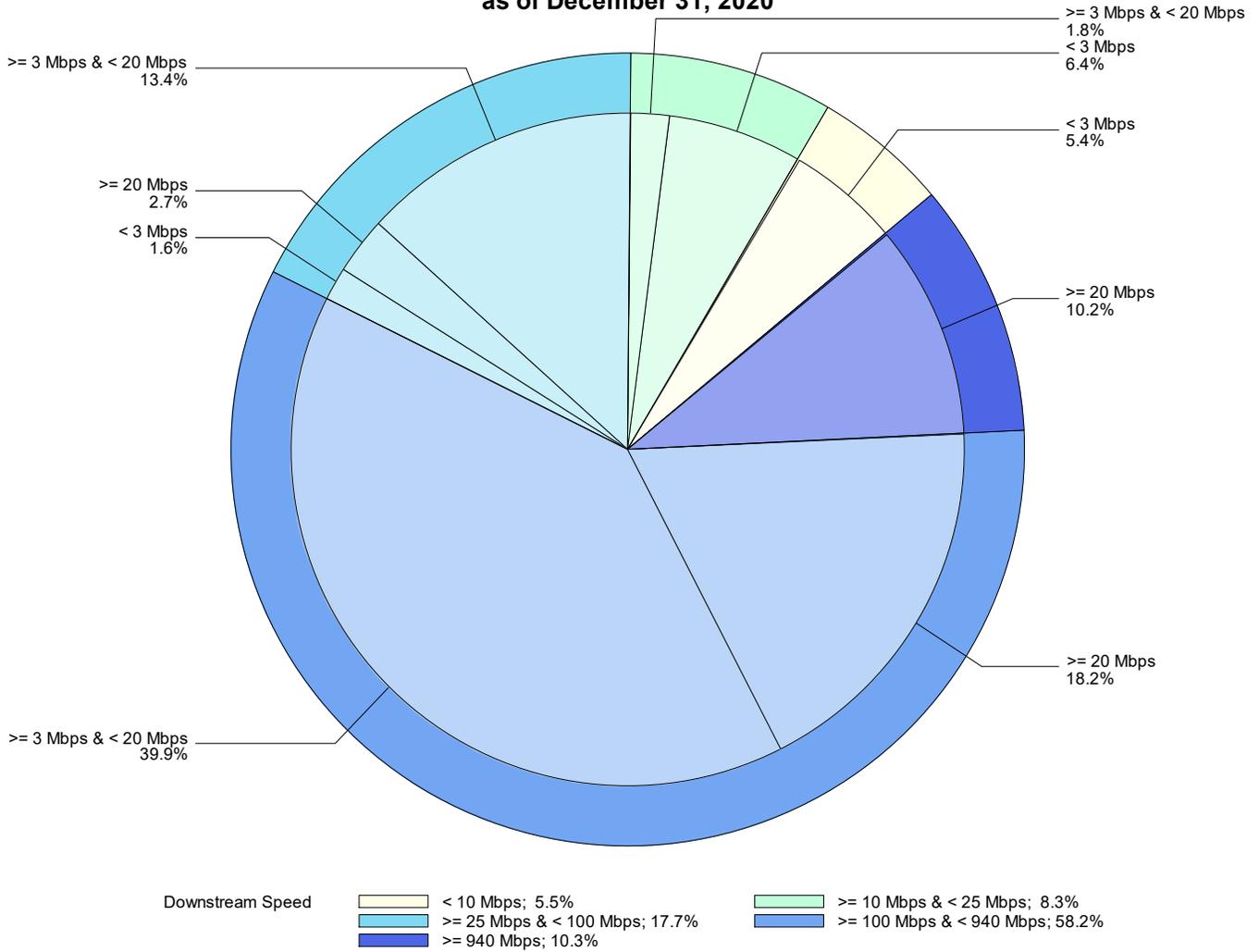
Fixed Connections over 200 kbps in at Least One Direction (in thousands)

| Upstream Speed | Downstream Speed | | | | | Total |
|-------------------------------------|-------------------|--|---|--|-------------------|----------------|
| | Less than 10 Mbps | At least 10 Mbps and less than 25 Mbps | At least 25 Mbps and less than 100 Mbps | At least 100 Mbps and less than 940 Mbps | At least 940 Mbps | |
| Less than 3 Mbps | 7,189 | 7,976 | 1,832 | 38 | 3 | 17,038 |
| At least 3 Mbps & Less than 20 Mbps | 222 | 2,295 | 17,208 | 46,295 | 110 | 66,132 |
| At least 20 Mbps | 2 | 63 | 3,523 | 22,653 | 11,840 | 38,081 |
| Total | 7,414 | 10,334 | 22,563 | 68,986 | 11,953 | 121,250 |

| Percentages | | | | | | |
|-------------------------------------|------------|------------|-------------|-------------|------------|--------------|
| Less than 3 Mbps | 5.9 | 6.6 | 1.5 | 0.0 | 0.0 | 14.1 |
| At least 3 Mbps & Less than 20 Mbps | 0.2 | 1.9 | 14.2 | 38.2 | 0.1 | 54.5 |
| At least 20 Mbps | 0.0 | 0.1 | 2.9 | 18.7 | 9.8 | 31.4 |
| Total | 6.1 | 8.5 | 18.6 | 56.9 | 9.9 | 100.0 |

Note: Numbers may not sum to totals due to rounding. # = Rounds to zero.
 Source: FCC Form 477.

Figure 10
Distribution of Residential Fixed Connections over 200 kbps in at Least One Direction
as of December 31, 2020



Note: Inner circle (light shading) represents upstream speeds.

Residential Fixed Connections over 200 kbps in at Least One Direction (in thousands)

| Upstream Speed | Downstream Speed | | | | | Total |
|-------------------------------------|-------------------|--|---|--|-------------------|---------|
| | Less than 10 Mbps | At least 10 Mbps and less than 25 Mbps | At least 25 Mbps and less than 100 Mbps | At least 100 Mbps and less than 940 Mbps | At least 940 Mbps | |
| Less than 3 Mbps | 5,985 | 7,173 | 1,767 | 37 | 3 | 14,964 |
| At least 3 Mbps & Less than 20 Mbps | 130 | 2,049 | 14,955 | 44,546 | 108 | 61,789 |
| At least 20 Mbps | 1 | 27 | 3,067 | 20,344 | 11,429 | 34,868 |
| Total | 6,115 | 9,249 | 19,790 | 64,927 | 11,540 | 111,621 |

| Percentages | | | | | | |
|-------------------------------------|-------------------|--|---|--|-------------------|-------|
| Upstream Speed | Less than 10 Mbps | At least 10 Mbps and less than 25 Mbps | At least 25 Mbps and less than 100 Mbps | At least 100 Mbps and less than 940 Mbps | At least 940 Mbps | Total |
| Less than 3 Mbps | 5.4 | 6.4 | 1.6 | 0.0 | 0.0 | 13.4 |
| At least 3 Mbps & Less than 20 Mbps | 0.1 | 1.8 | 13.4 | 39.9 | 0.1 | 55.4 |
| At least 20 Mbps | 0.0 | 0.0 | 2.7 | 18.2 | 10.2 | 31.2 |
| Total | 5.5 | 8.3 | 17.7 | 58.2 | 10.3 | 100.0 |

Note: Numbers may not sum to totals due to rounding. # = Rounds to zero.
 Source: FCC Form 477.

Figure 11
Connections over 200 kbps in at Least One Direction by Technology 2016-2020
(in thousands)

| Technology | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|-----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | Dec | Jun | Dec | Jun | Dec | Jun | Dec | Jun | Dec | |
| Total | 404,849 | 408,692 | 420,838 | 428,864 | 451,062 | 459,327 | 466,302 | 480,185 | 490,888 | |
| Total Fixed | 105,593 | 106,130 | 108,065 | 109,087 | 110,784 | 112,725 | 114,291 | 118,449 | 121,250 | |
| aDSL | 26,527 | 25,505 | 24,193 | 23,074 | 22,377 | 21,163 | 20,214 | 19,639 | 18,786 | |
| sDSL | 42 | 44 | 28 | 28 | 20 | 17 | 16 | 19 | 13 | |
| Other Wireline ¹ | 599 | 619 | 581 | 558 | 557 | 501 | 525 | 516 | 527 | |
| Cable Modem | 63,325 | 64,060 | 66,196 | 67,165 | 68,882 | 70,750 | 72,516 | 75,986 | 77,909 | |
| FTTP ² | 11,986 | 12,831 | 13,890 | 14,889 | 15,492 | 16,748 | 17,376 | 18,443 | 19,945 | |
| Satellite | 1,864 | 1,826 | 1,872 | 1,939 | 1,971 | 1,984 | 1,975 | 1,993 | 1,931 | |
| Fixed Wireless | 1,250 | 1,245 | 1,306 | 1,434 | 1,485 | 1,561 | 1,669 | 1,853 | 2,140 | |
| Mobile Wireless | 299,256 | 302,562 | 312,773 | 319,776 | 340,278 | 346,603 | 352,012 | 361,737 | 369,638 | |

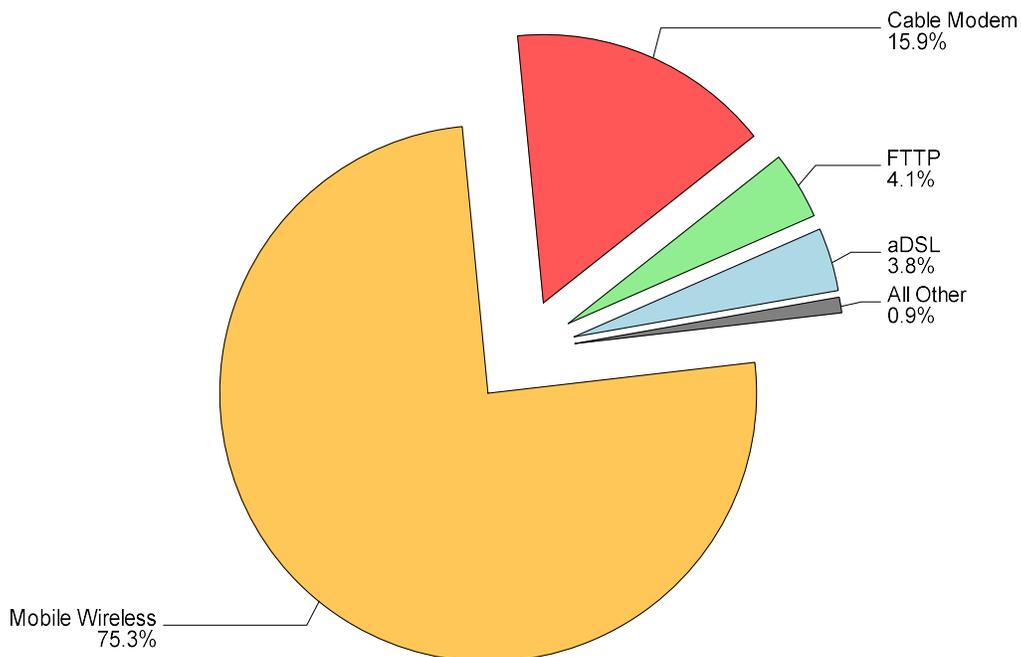
¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

² Fiber to the premises.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 12
Connections by Technology as of December 31, 2020



Source: FCC Form 477.

Figure 13
Residential Connections over 200 kbps in at Least One Direction by Technology 2016-2020
(in thousands)

| Technology | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|-----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|
| | Dec | Jun | Dec | Jun | Dec | Jun | Dec | Jun | Dec | |
| Total | 337,978 | 341,094 | 351,966 | 358,867 | 378,286 | 383,605 | 388,344 | 403,212 | 407,652 | |
| Total Fixed | 96,607 | 97,071 | 98,845 | 99,758 | 101,348 | 103,118 | 104,703 | 108,909 | 111,621 | |
| aDSL | 23,691 | 22,774 | 21,653 | 20,671 | 20,126 | 18,976 | 18,159 | 17,647 | 16,920 | |
| sDSL | 8 | 12 | 9 | 9 | 4 | 4 | 5 | 7 | 3 | |
| Other Wireline ¹ | 32 | 74 | 67 | 74 | 76 | 62 | 74 | 64 | 59 | |
| Cable Modem | 59,145 | 59,687 | 61,567 | 62,320 | 63,813 | 65,457 | 67,141 | 70,710 | 72,543 | |
| FTTP ² | 10,956 | 11,776 | 12,702 | 13,663 | 14,205 | 15,410 | 16,011 | 16,971 | 18,384 | |
| Satellite | 1,676 | 1,637 | 1,688 | 1,751 | 1,787 | 1,805 | 1,795 | 1,815 | 1,752 | |
| Fixed Wireless | 1,100 | 1,112 | 1,158 | 1,270 | 1,338 | 1,405 | 1,520 | 1,694 | 1,958 | |
| Mobile Wireless | 241,371 | 244,022 | 253,121 | 259,109 | 276,938 | 280,486 | 283,641 | 294,303 | 296,031 | |

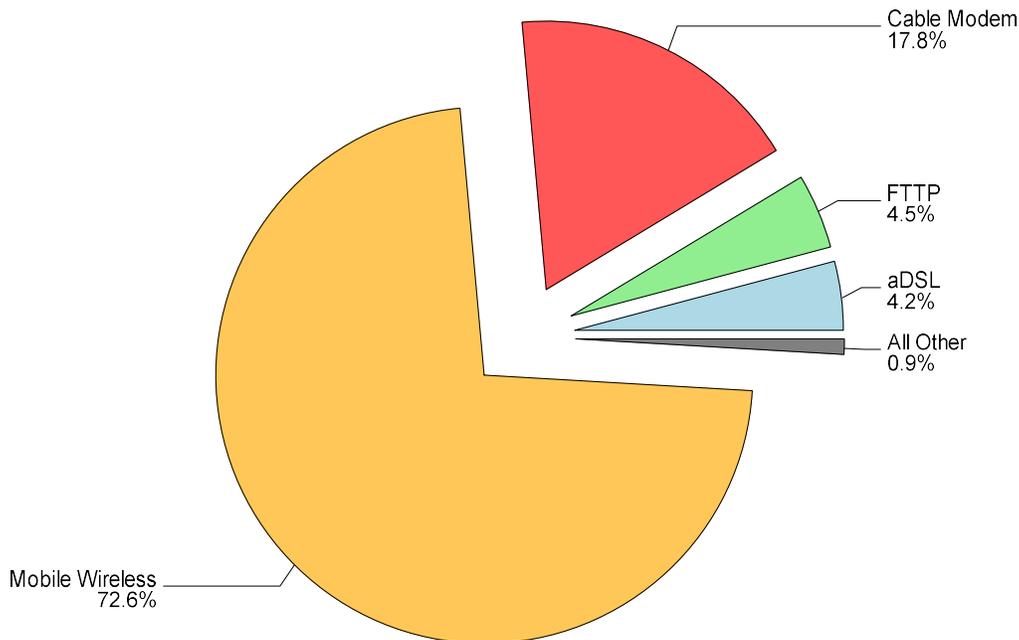
¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

² Fiber to the premises.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 14
Residential Connections by Technology as of December 31, 2020



Source: FCC Form 477.

Figure 15
Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2016-2020
 (in thousands)

| Technology | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|-----------------------------|--------|--------|--------|--------|--------|---------|---------|---------|---------|--|
| | Dec | Jun | Dec | Jun | Dec | Jun | Dec | Jun | Dec | |
| Total | 84,038 | 86,886 | 90,609 | 94,071 | 97,302 | 100,464 | 103,595 | 109,159 | 112,445 | |
| aDSL | 10,810 | 11,321 | 11,598 | 11,822 | 12,038 | 11,829 | 11,704 | 12,421 | 11,760 | |
| sDSL | 10 | 14 | 9 | 11 | 6 | 5 | 5 | 8 | 4 | |
| Other Wireline ¹ | 209 | 246 | 262 | 271 | 292 | 261 | 301 | 307 | 323 | |
| Cable Modem | 60,349 | 61,704 | 63,978 | 65,808 | 67,716 | 69,704 | 71,934 | 75,391 | 77,513 | |
| FTTP ² | 10,935 | 11,811 | 12,869 | 13,898 | 14,815 | 16,078 | 16,854 | 17,993 | 19,555 | |
| Satellite | 1,342 | 1,373 | 1,402 | 1,595 | 1,677 | 1,726 | 1,737 | 1,778 | 1,727 | |
| Fixed Wireless | 383 | 418 | 491 | 666 | 759 | 861 | 1,059 | 1,263 | 1,564 | |

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

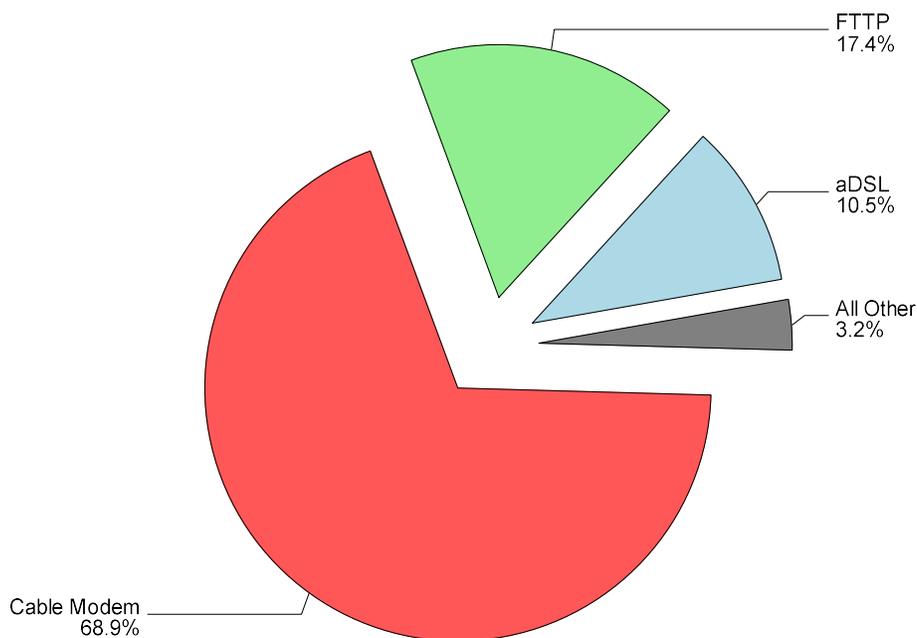
² Fiber to the premises.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 16
Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream
by Technology as of December 31, 2020



Source: FCC Form 477.

Figure 17

Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2016-2020
(in thousands)

| Technology | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|---------|---------|--|
| | Dec | Jun | Dec | Jun | Dec | Jun | Dec | Jun | Dec | |
| Total | 78,201 | 80,671 | 84,163 | 86,973 | 89,873 | 92,698 | 95,649 | 101,201 | 104,199 | |
| aDSL | 9,963 | 10,415 | 10,657 | 10,862 | 11,073 | 10,812 | 10,682 | 11,374 | 10,761 | |
| sDSL | 2 | 6 | 5 | 6 | 2 | 1 | 2 | 4 | 1 | |
| Other Wireline ¹ | 30 | 71 | 64 | 65 | 68 | 58 | 70 | 61 | 56 | |
| Cable Modem | 56,538 | 57,617 | 59,864 | 61,142 | 62,810 | 64,556 | 66,691 | 70,299 | 72,215 | |
| FTTP ² | 10,004 | 10,835 | 11,762 | 12,741 | 13,589 | 14,800 | 15,536 | 16,566 | 18,042 | |
| Satellite | 1,333 | 1,362 | 1,387 | 1,575 | 1,655 | 1,702 | 1,708 | 1,745 | 1,691 | |
| Fixed Wireless | 332 | 365 | 425 | 582 | 676 | 768 | 960 | 1,151 | 1,433 | |

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

² Fiber to the premises.

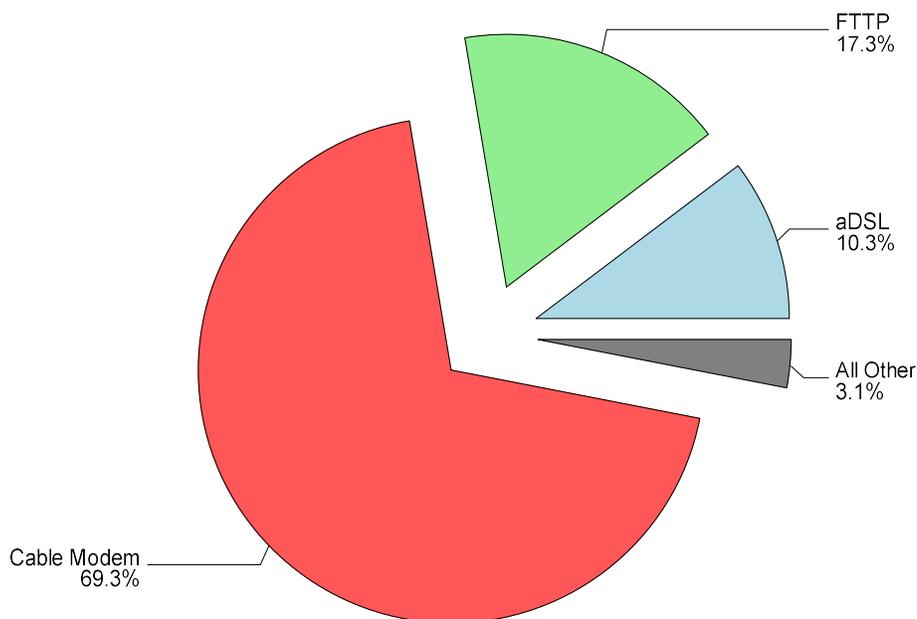
= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 18

Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology as of December 31, 2020



Source: FCC Form 477.

Figure 19
Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2016-2020
(in thousands)

| Technology | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--|
| | Dec | Jun | Dec | Jun | Dec | Jun | Dec | Jun | Dec | |
| Total | 62,933 | 68,280 | 73,875 | 78,952 | 82,965 | 86,744 | 90,471 | 96,984 | 101,630 | |
| aDSL | 1,476 | 2,530 | 3,586 | 4,298 | 4,988 | 5,233 | 5,523 | 5,910 | 6,237 | |
| sDSL | * | * | * | * | * | * | * | * | * | |
| Other Wireline ¹ | 166 | 203 | 219 | 203 | 228 | 220 | 263 | 273 | 286 | |
| Cable Modem | 51,740 | 54,829 | 57,870 | 60,859 | 62,880 | 64,938 | 67,171 | 71,856 | 74,169 | |
| FTTP ² | 9,422 | 10,344 | 11,489 | 12,568 | 13,605 | 14,902 | 15,866 | 17,076 | 18,840 | |
| Satellite | * | * | * | * | * | * | * | * | * | |
| Fixed Wireless | 92 | 120 | 143 | 224 | 267 | 325 | 449 | 571 | 804 | |

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

² Fiber to the premises.

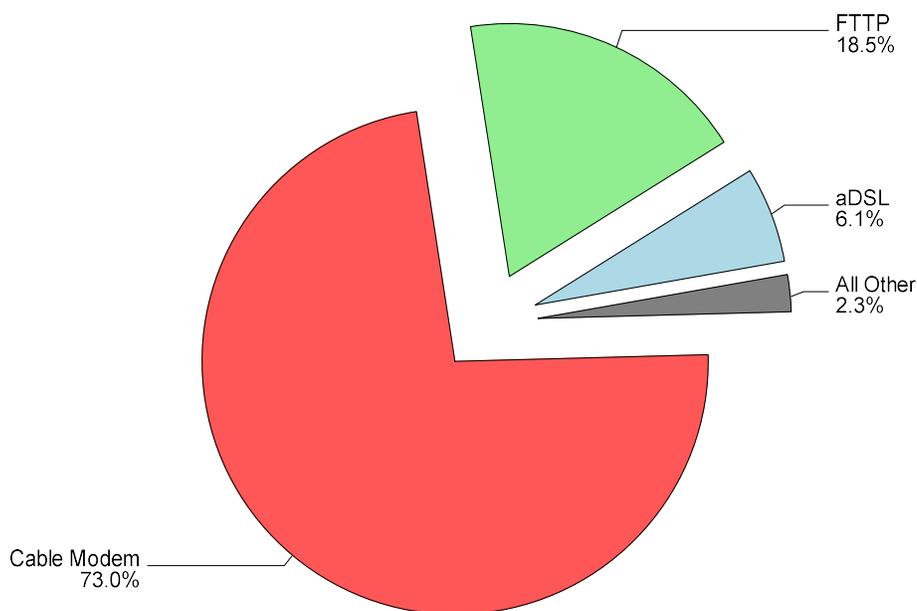
* = Data withheld for confidentiality reasons.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 20
Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream
by Technology as of December 31, 2020



Source: FCC Form 477.

Figure 21
Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2016-2020
(in thousands)

| Technology | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| | Dec | Jun | Dec | Jun | Dec | Jun | Dec | Jun | Dec | |
| Total | 59,518 | 64,520 | 69,447 | 73,288 | 76,873 | 80,256 | 83,725 | 90,170 | 94,451 | |
| aDSL | 1,408 | 2,418 | 3,410 | 4,068 | 4,712 | 4,911 | 5,168 | 5,538 | 5,871 | |
| sDSL | * | * | * | * | * | * | * | * | * | |
| Other Wireline ¹ | 27 | 67 | 59 | 54 | 61 | 53 | 64 | 56 | 51 | |
| Cable Modem | 49,300 | 52,154 | 54,748 | 56,620 | 58,342 | 60,125 | 62,231 | 67,017 | 69,098 | |
| FTTP ² | 8,674 | 9,532 | 10,553 | 11,570 | 12,546 | 13,780 | 14,690 | 15,781 | 17,445 | |
| Satellite | * | * | * | * | * | * | * | * | * | |
| Fixed Wireless | 75 | 101 | 119 | 193 | 234 | 283 | 400 | 512 | 727 | |

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

² Fiber to the premises.

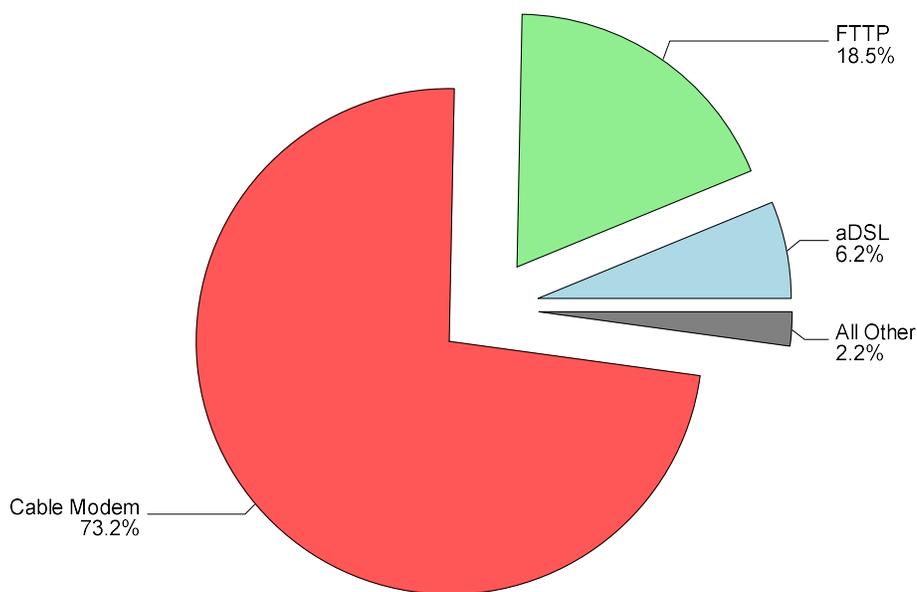
* = Data withheld for confidentiality reasons.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 22
Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream
by Technology as of December 31, 2020



Source: FCC Form 477.

Figure 23
Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream by Technology 2016-2020
(in thousands)

| Technology | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|-----------------------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--|
| | Dec | Jun | Dec | Jun | Dec | Jun | Dec | Jun | Dec | |
| Total | 7,968 | 9,676 | 12,148 | 14,619 | 18,750 | 22,217 | 25,603 | 29,554 | 34,493 | |
| aDSL | 2 | 16 | 47 | 59 | 207 | 387 | 569 | 658 | 774 | |
| sDSL | 1 | 1 | 1 | 1 | 1 | # | * | * | * | |
| Other Wireline ¹ | 140 | 174 | 192 | 174 | 196 | 178 | 211 | 213 | 217 | |
| Cable Modem | 5,356 | 6,055 | 7,149 | 8,352 | 9,466 | 11,426 | 13,088 | 15,496 | 18,420 | |
| FTTP ² | 2,438 | 3,403 | 4,729 | 5,976 | 8,815 | 10,146 | 11,634 | 13,071 | 14,933 | |
| Satellite | 0 | 0 | 0 | 0 | 0 | 0 | * | * | * | |
| Fixed Wireless | 31 | 28 | 30 | 56 | 65 | 79 | 101 | 116 | 143 | |

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

² Fiber to the premises.

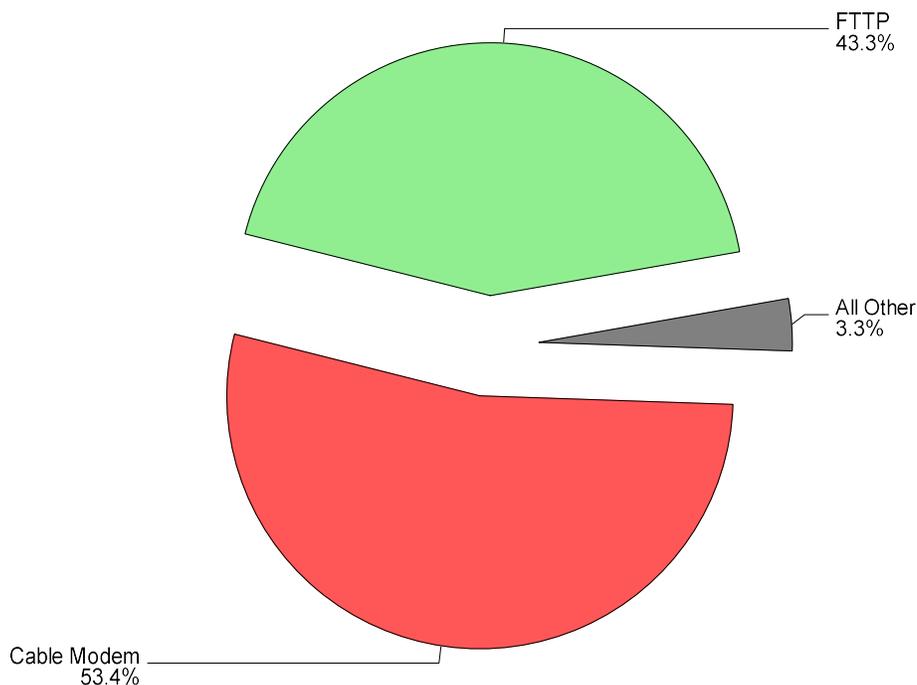
* = Data withheld for confidentiality reasons.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 24
Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream
by Technology as of December 31, 2020



Source: FCC Form 477.

Figure 25
Residential Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream by Technology 2016-2020
 (in thousands)

| Technology | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|-----------------------------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--|
| | Dec | Jun | Dec | Jun | Dec | Jun | Dec | Jun | Dec | |
| Total | 7,291 | 8,879 | 11,030 | 13,171 | 17,101 | 20,322 | 23,469 | 27,164 | 31,773 | |
| aDSL | 2 | 15 | 42 | 53 | 194 | 344 | 512 | 594 | 733 | |
| sDSL | # | # | # | # | # | # | * | * | * | |
| Other Wireline ¹ | 24 | 61 | 53 | 46 | 47 | 27 | 36 | 27 | 20 | |
| Cable Modem | 5,071 | 5,695 | 6,591 | 7,491 | 8,512 | 10,312 | 11,883 | 14,157 | 16,843 | |
| FTTP ² | 2,170 | 3,089 | 4,324 | 5,534 | 8,292 | 9,574 | 10,952 | 12,288 | 14,055 | |
| Satellite | 0 | 0 | 0 | 0 | 0 | 0 | * | * | * | |
| Fixed Wireless | 24 | 20 | 20 | 47 | 56 | 65 | 86 | 98 | 118 | |

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

² Fiber to the premises.

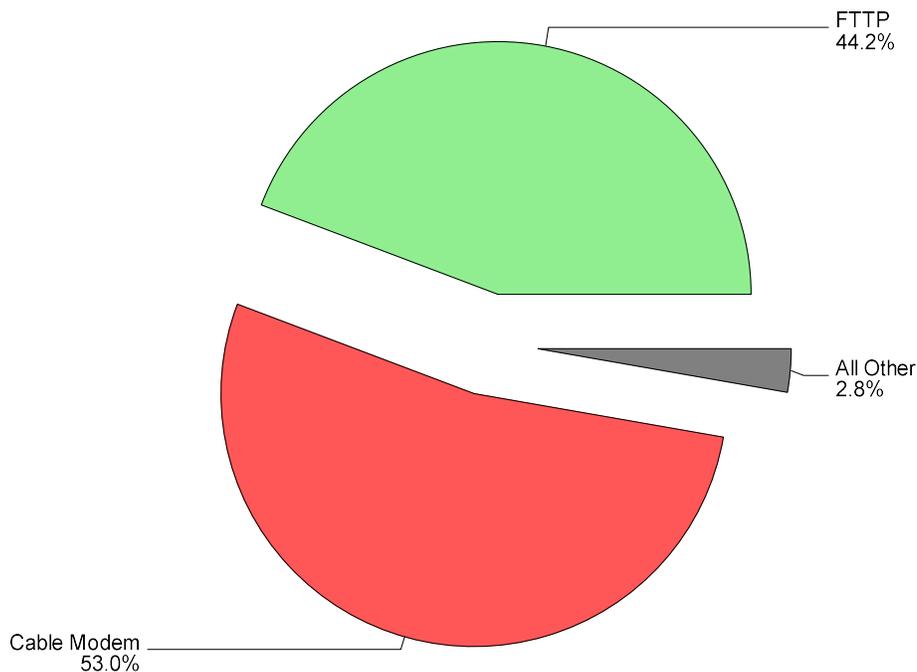
* = Data withheld for confidentiality reasons.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

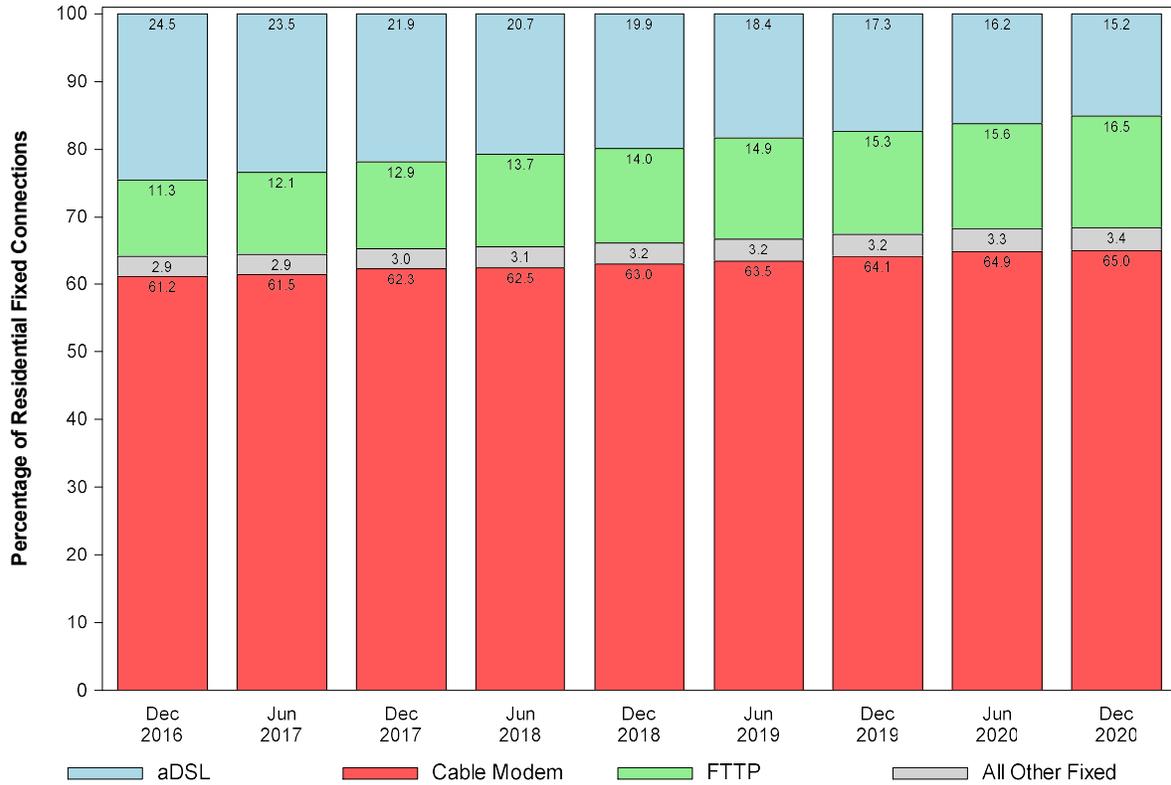
Source: FCC Form 477.

Figure 26
Residential Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream
by Technology as of December 31, 2020



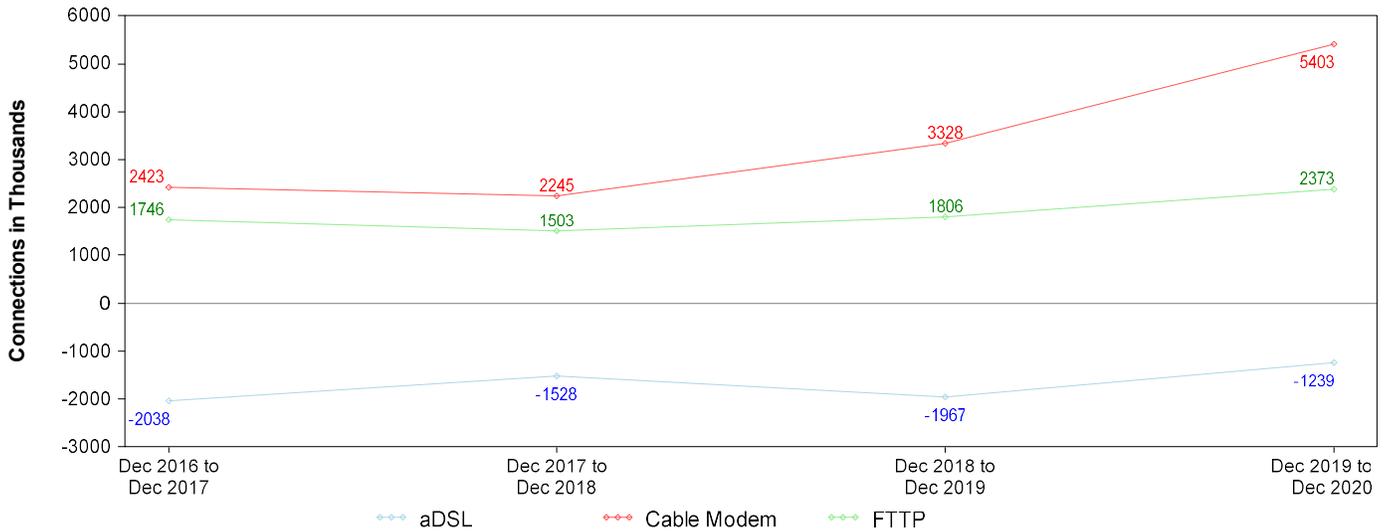
Source: FCC Form 477.

Figure 27
Residential Fixed Connections over 200 kbps in at Least One Direction 2016-2020
 (Shares of selected technologies)



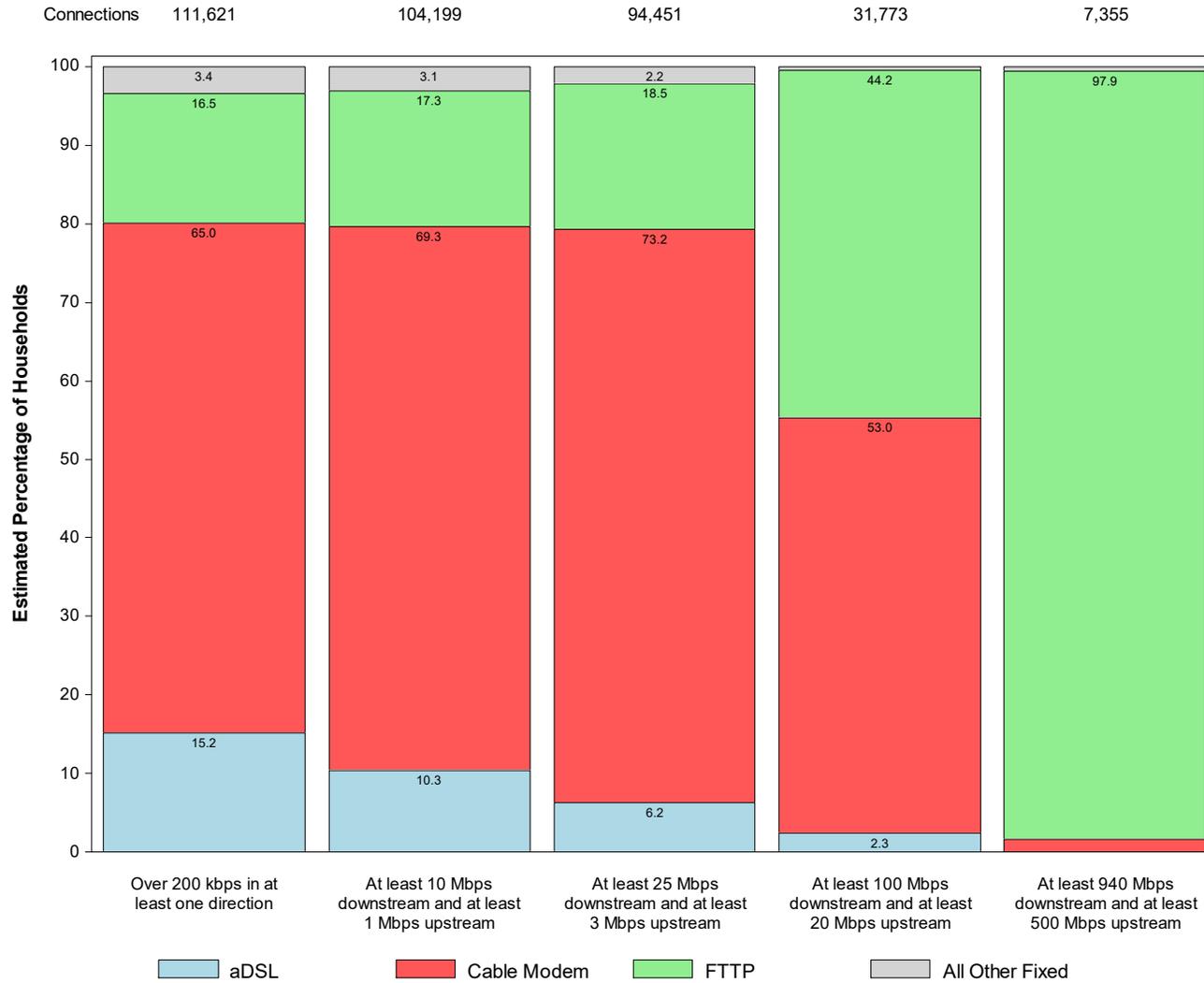
Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.
 Source: FCC Form 477.

Figure 28
Residential Fixed Connections over 200 kbps in at Least One Direction 2016-2020
 (Net adds for selected technologies)



Source: FCC Form 477.

Figure 29
Residential Fixed Connections by Technology as of December 31, 2020
(Shares of selected technologies for selected speeds, connections in thousands)



Note: Numbers may not sum to totals due to rounding.
 Source: FCC Form 477.

Figure 30
Fixed Connections by Downstream Speed Tier and Technology as of December 31, 2020
(in thousands)

| <i>Technology</i> | <i>Downstream Speed</i> | | | | | | <i>Total</i> |
|-----------------------------|-------------------------|--|---|--|---|--------------------------|----------------|
| | <i>Less than 4 Mbps</i> | <i>At least 4 Mbps and less than 10 Mbps</i> | <i>At least 10 Mbps and less than 25 Mbps</i> | <i>At least 25 Mbps and less than 100 Mbps</i> | <i>At least 100 Mbps and less than 940 Mbps</i> | <i>At least 940 Mbps</i> | |
| aDSL | 2,432 | 3,248 | 6,277 | 5,873 | 955 | # | 18,786 |
| sDSL | * | 1 | * | * | * | * | 13 |
| Other Wireline ¹ | 172 | 32 | 33 | 46 | 221 | 23 | 527 |
| Cable Modem | 204 | 183 | 2,136 | 11,099 | 59,956 | 4,329 | 77,909 |
| FTTP | 119 | 234 | 703 | 3,611 | 7,719 | 7,559 | 19,945 |
| Satellite | * | 42 | * | * | * | 0 | 1,931 |
| Fixed Wireless | 202 | 373 | 748 | 660 | 115 | 41 | 2,140 |
| Total | 3,299 | 4,114 | 10,334 | 22,563 | 68,986 | 11,953 | 121,250 |

| <i>Percentages</i> | | | | | | | |
|-----------------------------|------------|------------|------------|-------------|-------------|------------|--------------|
| aDSL | 2.0 | 2.7 | 5.2 | 4.8 | 0.8 | 0.0 | 15.5 |
| sDSL | * | 0.0 | * | * | * | * | 0.0 |
| Other Wireline ¹ | 0.1 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.4 |
| Cable Modem | 0.2 | 0.2 | 1.8 | 9.2 | 49.4 | 3.6 | 64.3 |
| FTTP | 0.1 | 0.2 | 0.6 | 3.0 | 6.4 | 6.2 | 16.4 |
| Satellite | * | 0.0 | * | * | * | 0.0 | 1.6 |
| Fixed Wireless | 0.2 | 0.3 | 0.6 | 0.5 | 0.1 | 0.0 | 1.8 |
| Total | 2.7 | 3.4 | 8.5 | 18.6 | 56.9 | 9.9 | 100.0 |

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

= Rounds to Zero.

* = Data withheld for confidentiality reasons.

Note: Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 31
Residential Fixed Connections by Downstream Speed Tier and Technology as of December 31, 2020
(in thousands)

| Technology | Downstream Speed | | | | | | Total |
|-----------------------------|------------------|---------------------------------------|--|---|--|-------------------|----------------|
| | Less than 4 Mbps | At least 4 Mbps and less than 10 Mbps | At least 10 Mbps and less than 25 Mbps | At least 25 Mbps and less than 100 Mbps | At least 100 Mbps and less than 940 Mbps | At least 940 Mbps | |
| aDSL | 2,045 | 2,850 | 5,608 | 5,514 | * | * | 16,920 |
| sDSL | * | # | * | * | * | * | 3 |
| Other Wireline ¹ | 2 | 1 | 5 | 5 | 27 | 19 | 59 |
| Cable Modem | 183 | 138 | 1,919 | 9,284 | 56,849 | 4,171 | 72,543 |
| FTTP | 96 | 212 | 588 | 3,139 | 7,036 | 7,314 | 18,384 |
| Satellite | * | * | * | * | * | 0 | 1,752 |
| Fixed Wireless | 178 | 347 | 696 | 608 | 93 | 37 | 1,958 |
| Total | 2,527 | 3,589 | 9,249 | 19,790 | 64,927 | 11,540 | 111,621 |

| Percentages | | | | | | | |
|-----------------------------|------------|------------|------------|-------------|-------------|-------------|--------------|
| aDSL | 1.8 | 2.6 | 5.0 | 4.9 | * | * | 15.2 |
| sDSL | * | 0.0 | * | * | * | * | 0.0 |
| Other Wireline ¹ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Cable Modem | 0.2 | 0.1 | 1.7 | 8.3 | 50.9 | 3.7 | 65.0 |
| FTTP | 0.1 | 0.2 | 0.5 | 2.8 | 6.3 | 6.6 | 16.5 |
| Satellite | * | * | * | * | * | 0.0 | 1.6 |
| Fixed Wireless | 0.2 | 0.3 | 0.6 | 0.5 | 0.1 | 0.0 | 1.8 |
| Total | 2.3 | 3.2 | 8.3 | 17.7 | 58.2 | 10.3 | 100.0 |

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

= Rounds to Zero.

* = Data withheld for confidentiality reasons.

Note: Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 32
Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction
by Technology 2016-2020

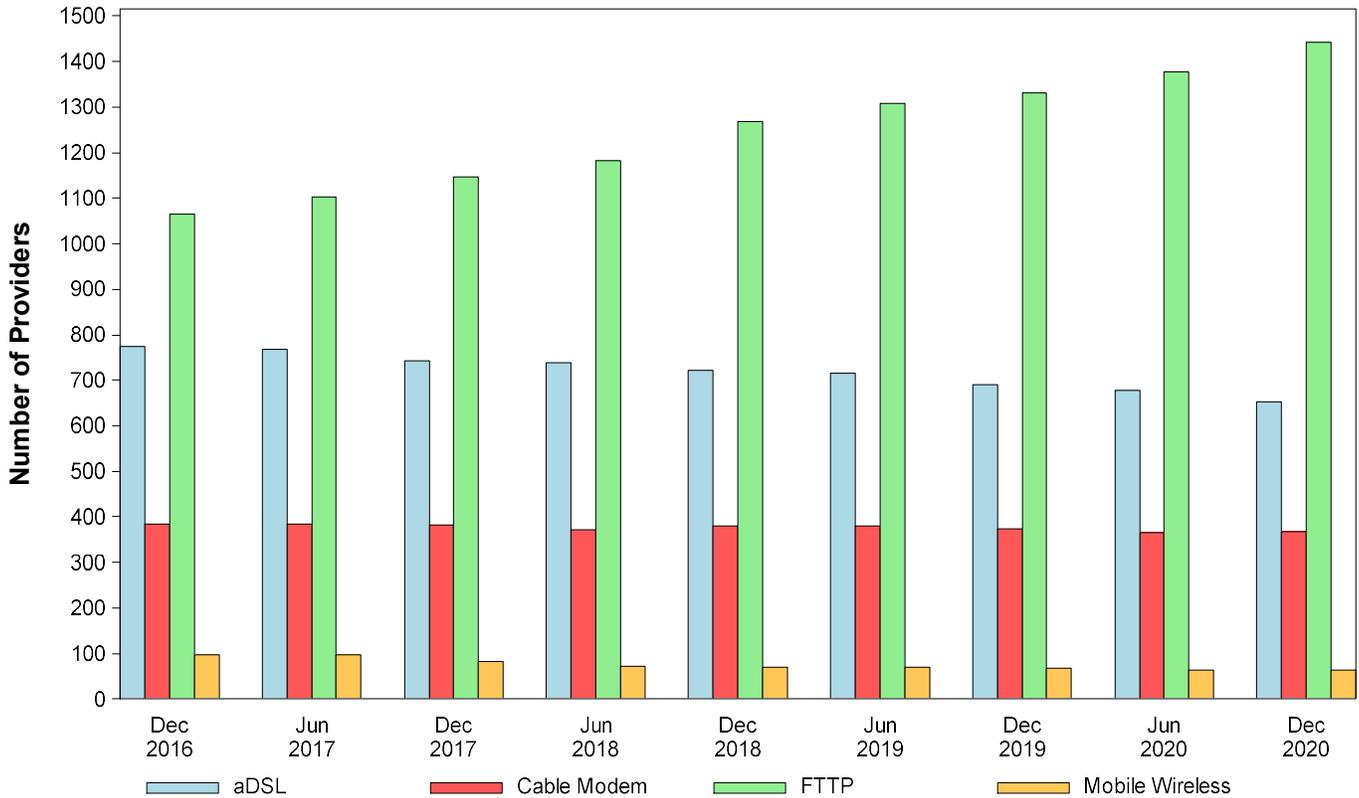
| Technology | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | |
|-----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--|
| | Dec | Jun | Dec | Jun | Dec | Jun | Dec | Jun | Dec | |
| aDSL | 774 | 768 | 743 | 738 | 721 | 715 | 691 | 677 | 653 | |
| sDSL | 160 | 161 | 150 | 136 | 127 | 123 | 121 | 118 | 106 | |
| Other Wireline ¹ | 236 | 243 | 235 | 249 | 243 | 222 | 211 | 215 | 209 | |
| Cable Modem | 385 | 384 | 383 | 372 | 381 | 381 | 373 | 365 | 368 | |
| FTTP | 1,066 | 1,103 | 1,147 | 1,183 | 1,269 | 1,309 | 1,330 | 1,377 | 1,441 | |
| Satellite | 6 | 5 | 6 | 6 | 6 | 6 | 5 | 5 | 6 | |
| Fixed Wireless | 1,071 | 1,095 | 1,160 | 1,188 | 1,239 | 1,248 | 1,280 | 1,312 | 1,396 | |
| Mobile Wireless | 98 | 98 | 83 | 73 | 71 | 70 | 67 | 64 | 64 | |
| Total | 2,000 | 2,030 | 2,090 | 2,129 | 2,215 | 2,223 | 2,247 | 2,279 | 2,381 | |

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons.

Note: Multiple FCC Form 477 filers within a holding company structure count as one provider. Some previously-published data may have been revised.

Source: FCC Form 477.

Figure 33
Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction
Selected Technologies 2016-2020



Source: FCC Form 477.

SECTION 3
SUMMARY STATISTICS: THE STATES

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Figure 34
Residential Fixed Connections and Households by State as of December 31, 2020
(Connections and households, in thousands)

| State | Households | At least 200 kbps in at least One Direction | | At least 10 Mbps Down and 1 Mbps Up | | At least 25 Mbps Down and 3 Mbps Up | | At least 100 Mbps Down and 20 Mbps Up | | At least 940 Mbps Down and 500 Mbps Up | |
|----------------------|------------|--|-------------------------|--|-------------------------|--|-------------------------|--|-------------------------|---|-------------------------|
| | | Connections | Subscribership Ratio | Connections | Subscribership Ratio | Connections | Subscribership Ratio | Connections | Subscribership Ratio | Connections | Subscribership Ratio |
| Alabama | 1,889 | 1,552 | 0.82 | 1,383 | 0.73 | 1,181 | 0.63 | 377 | 0.20 | 105 | 0.06 |
| Alaska | 255 | 222 | 0.87 | 202 | 0.79 | 152 | 0.59 | * | * | * | * |
| American Samoa | 10 | * | * | * | * | * | * | 0 | 0.00 | 0 | 0.00 |
| Arizona | 2,643 | 2,444 | 0.92 | 2,205 | 0.83 | 2,013 | 0.76 | 502 | 0.19 | * | * |
| Arkansas | 1,170 | 906 | 0.77 | 776 | 0.66 | 630 | 0.54 | 218 | 0.19 | 45 | 0.04 |
| California | 13,103 | 12,330 | 0.94 | 11,766 | 0.90 | 10,873 | 0.83 | 2,871 | 0.22 | 500 | 0.04 |
| Colorado | 2,137 | 2,106 | 0.99 | 1,918 | 0.90 | 1,810 | 0.85 | 338 | 0.16 | 100 | 0.05 |
| Connecticut | 1,385 | 1,305 | 0.94 | 1,247 | 0.90 | 1,095 | 0.79 | 347 | 0.25 | 12 | 0.01 |
| Delaware | 371 | 381 | 1.03 | 372 | 1.00 | 367 | 0.99 | 115 | 0.31 | * | * |
| District of Columbia | 288 | 273 | 0.95 | 266 | 0.92 | 261 | 0.91 | 107 | 0.37 | * | * |
| Florida | 7,931 | 8,078 | 1.02 | 7,719 | 0.97 | 6,948 | 0.88 | 2,448 | 0.31 | 364 | 0.05 |
| Georgia | 3,830 | 3,470 | 0.91 | 3,231 | 0.84 | 2,804 | 0.73 | 1,172 | 0.31 | 341 | 0.09 |
| Guam | 42 | * | * | * | * | * | * | 0 | 0.00 | 0 | 0.00 |
| Hawaii | 468 | 487 | 1.04 | 472 | 1.01 | * | * | * | * | * | * |
| Idaho | 649 | 572 | 0.88 | 471 | 0.72 | 381 | 0.59 | 141 | 0.22 | 18 | 0.03 |
| Illinois | 4,884 | 4,201 | 0.86 | 3,951 | 0.81 | 3,350 | 0.69 | 1,181 | 0.24 | 115 | 0.02 |
| Indiana | 2,603 | 2,204 | 0.85 | 2,004 | 0.77 | 1,681 | 0.65 | 621 | 0.24 | 105 | 0.04 |
| Iowa | 1,274 | 1,050 | 0.82 | 899 | 0.71 | 794 | 0.62 | 271 | 0.21 | 25 | 0.02 |
| Kansas | 1,142 | 979 | 0.86 | 894 | 0.78 | 766 | 0.67 | 285 | 0.25 | 104 | 0.09 |
| Kentucky | 1,748 | 1,479 | 0.85 | 1,336 | 0.76 | 1,171 | 0.67 | 382 | 0.22 | 65 | 0.04 |
| Louisiana | 1,752 | 1,427 | 0.81 | 1,303 | 0.74 | 1,117 | 0.64 | 371 | 0.21 | 72 | 0.04 |
| Maine | 570 | 565 | 0.99 | 507 | 0.89 | 423 | 0.74 | 42 | 0.07 | 1 | 0.00 |
| Maryland | 2,231 | 2,135 | 0.96 | 2,078 | 0.93 | 2,025 | 0.91 | 803 | 0.36 | * | * |
| Massachusetts | 2,647 | 2,522 | 0.95 | 2,451 | 0.93 | 2,417 | 0.91 | 659 | 0.25 | * | * |
| Michigan | 3,980 | 3,435 | 0.86 | 3,201 | 0.80 | 2,761 | 0.69 | 707 | 0.18 | 65 | 0.02 |
| Minnesota | 2,208 | 1,952 | 0.88 | 1,741 | 0.79 | 1,596 | 0.72 | 308 | 0.14 | 45 | 0.02 |
| Mississippi | 1,117 | 824 | 0.74 | 712 | 0.64 | 534 | 0.48 | 180 | 0.16 | 59 | 0.05 |
| Missouri | 2,440 | 2,039 | 0.84 | 1,799 | 0.74 | 1,559 | 0.64 | 592 | 0.24 | 168 | 0.07 |
| Montana | 436 | 386 | 0.89 | 331 | 0.76 | 284 | 0.65 | 44 | 0.10 | 7 | 0.02 |
| Nebraska | 767 | 656 | 0.86 | 601 | 0.78 | 529 | 0.69 | 170 | 0.22 | 28 | 0.04 |

Figure 34 - Continued
Residential Fixed Connections and Households by State as of December 31, 2020
(Connections and households, in thousands)

| State | Households | At least 200 kbps in at least One Direction | | At least 10 Mbps Down and 1 Mbps Up | | At least 25 Mbps Down and 3 Mbps Up | | At least 100 Mbps Down and 20 Mbps Up | | At least 940 Mbps Down and 500 Mbps Up | |
|----------------------|----------------|--|-------------------------|--|-------------------------|--|-------------------------|--|-------------------------|---|-------------------------|
| | | Connections | Subscribership Ratio | Connections | Subscribership Ratio | Connections | Subscribership Ratio | Connections | Subscribership Ratio | Connections | Subscribership Ratio |
| Nevada | 1,130 | 1,071 | 0.95 | 1,016 | 0.90 | 925 | 0.82 | 249 | 0.22 | 31 | 0.03 |
| New Hampshire | 539 | 550 | 1.02 | 522 | 0.97 | 489 | 0.91 | 108 | 0.20 | 2 | 0.00 |
| New Jersey | 3,272 | 3,144 | 0.96 | 3,075 | 0.94 | 3,021 | 0.92 | 1,714 | 0.52 | * | * |
| New Mexico | 793 | 677 | 0.85 | 548 | 0.69 | 488 | 0.62 | 69 | 0.09 | 5 | 0.01 |
| New York | 7,417 | 6,630 | 0.89 | 6,500 | 0.88 | 6,200 | 0.84 | 3,467 | 0.47 | * | * |
| North Carolina | 4,032 | 3,784 | 0.94 | 3,446 | 0.85 | 3,214 | 0.80 | 1,064 | 0.26 | 270 | 0.07 |
| North Dakota | 321 | 276 | 0.86 | 266 | 0.83 | 249 | 0.78 | 103 | 0.32 | 3 | 0.01 |
| Northern Mariana Isl | 16 | * | * | * | * | * | * | 0 | 0.00 | 0 | 0.00 |
| Ohio | 4,717 | 4,125 | 0.87 | 3,826 | 0.81 | 3,388 | 0.72 | 781 | 0.17 | * | * |
| Oklahoma | 1,494 | 1,193 | 0.80 | 1,068 | 0.71 | 904 | 0.61 | 314 | 0.21 | 79 | 0.05 |
| Oregon | 1,643 | 1,488 | 0.91 | 1,354 | 0.82 | 1,263 | 0.77 | 229 | 0.14 | 47 | 0.03 |
| Pennsylvania | 5,107 | 4,537 | 0.89 | 4,238 | 0.83 | 4,080 | 0.80 | 1,222 | 0.24 | * | * |
| Puerto Rico | 1,206 | 673 | 0.56 | 586 | 0.49 | 355 | 0.29 | 108 | 0.09 | 4 | 0.00 |
| Rhode Island | 415 | 393 | 0.95 | 390 | 0.94 | 381 | 0.92 | 204 | 0.49 | * | * |
| South Carolina | 1,961 | 1,790 | 0.91 | 1,678 | 0.86 | 1,489 | 0.76 | 493 | 0.25 | 73 | 0.04 |
| South Dakota | 348 | 297 | 0.85 | 285 | 0.82 | 271 | 0.78 | 84 | 0.24 | 1 | 0.00 |
| Tennessee | 2,640 | 2,274 | 0.86 | 2,129 | 0.81 | 1,867 | 0.71 | 777 | 0.29 | 204 | 0.08 |
| Texas | 9,906 | 8,996 | 0.91 | 8,547 | 0.86 | 7,725 | 0.78 | 3,154 | 0.32 | 935 | 0.09 |
| Utah | 1,003 | 948 | 0.95 | 870 | 0.87 | 803 | 0.80 | 218 | 0.22 | 68 | 0.07 |
| Vermont | 263 | 262 | 1.00 | 226 | 0.86 | 187 | 0.71 | 33 | 0.12 | * | * |
| Virgin Islands | 43 | * | * | * | * | * | * | * | * | 0 | 0.00 |
| Virginia | 3,184 | 2,864 | 0.90 | 2,689 | 0.84 | 2,572 | 0.81 | 1,025 | 0.32 | * | * |
| Washington | 2,906 | 2,715 | 0.93 | 2,488 | 0.86 | 2,345 | 0.81 | 414 | 0.14 | 104 | 0.04 |
| West Virginia | 734 | 572 | 0.78 | 468 | 0.64 | 401 | 0.55 | 119 | 0.16 | 2 | 0.00 |
| Wisconsin | 2,378 | 2,090 | 0.88 | 1,899 | 0.80 | 1,652 | 0.69 | 301 | 0.13 | 46 | 0.02 |
| Wyoming | 233 | 206 | 0.89 | 183 | 0.79 | 164 | 0.70 | 18 | 0.08 | 1 | 0.00 |
| Total | 123,671 | 111,621 | 0.90 | 104,199 | 0.84 | 94,451 | 0.76 | 31,773 | 0.26 | 7,355 | 0.06 |

= Rounds to Zero; * = Data withheld for confidentiality reasons.

Note: Numbers may not sum to totals due to rounding.

Sources: FCC Form 477 (Connections); 2016-2020 ACS 5-year estimates; Census 2010.

Figure 35
Connections by Type of End User by State as of December 31, 2020
 (Connections over 200 kbps in at least one direction, in thousands)

| State | Connections | | Percentages | | Total |
|----------------------|----------------|---------------|-------------|-------------|----------------|
| | Residential | Business | Residential | Business | |
| Alabama | 5,692 | 1,416 | 80.1 | 19.9 | 7,108 |
| Alaska | 862 | 137 | 86.3 | 13.7 | 0 |
| American Samoa | * | * | * | * | * |
| Arizona | 8,697 | 1,508 | 85.2 | 14.8 | 10,205 |
| Arkansas | 3,311 | 861 | 79.4 | 20.6 | 4,172 |
| California | 50,789 | 9,896 | 83.7 | 16.3 | 60,686 |
| Colorado | 7,085 | 1,464 | 82.9 | 17.1 | 8,549 |
| Connecticut | 4,631 | 925 | 83.4 | 16.6 | 5,556 |
| Delaware | 1,257 | 248 | 83.5 | 16.5 | 1,505 |
| District of Columbia | 1,056 | 597 | 63.9 | 36.1 | 1,653 |
| Florida | 28,001 | 4,841 | 85.3 | 14.7 | 32,842 |
| Georgia | 12,885 | 2,965 | 81.3 | 18.7 | 15,850 |
| Guam | * | * | * | * | * |
| Hawaii | 1,829 | 353 | 83.8 | 16.2 | 2,182 |
| Idaho | 2,032 | 400 | 83.6 | 16.4 | 2,432 |
| Illinois | 15,810 | 3,315 | 82.7 | 17.3 | 19,125 |
| Indiana | 7,687 | 1,568 | 83.1 | 16.9 | 9,256 |
| Iowa | 3,572 | 792 | 81.8 | 18.2 | 4,365 |
| Kansas | 3,429 | 704 | 83.0 | 17.0 | 4,133 |
| Kentucky | 5,246 | 918 | 85.1 | 14.9 | 6,164 |
| Louisiana | 5,701 | 1,020 | 84.8 | 15.2 | 6,721 |
| Maine | 1,512 | 461 | 76.6 | 23.4 | 1,973 |
| Maryland | 7,883 | 1,369 | 85.2 | 14.8 | 9,252 |
| Massachusetts | 8,718 | 1,748 | 83.3 | 16.7 | 10,466 |
| Michigan | 12,095 | 2,407 | 83.4 | 16.6 | 14,502 |
| Minnesota | 6,691 | 1,429 | 82.4 | 17.6 | 8,121 |
| Mississippi | 3,412 | 664 | 83.7 | 16.3 | 4,076 |
| Missouri | 7,240 | 1,445 | 83.4 | 16.6 | 8,685 |
| Montana | 1,172 | 333 | 77.9 | 22.1 | 1,505 |
| Nebraska | 2,182 | 592 | 78.6 | 21.4 | 2,774 |
| Nevada | 3,953 | 576 | 87.3 | 12.7 | 4,529 |
| New Hampshire | 1,626 | 407 | 80.0 | 20.0 | 2,033 |
| New Jersey | 11,931 | 2,162 | 84.7 | 15.3 | 14,093 |
| New Mexico | 2,514 | 460 | 84.5 | 15.5 | 2,974 |
| New York | 25,332 | 5,510 | 82.1 | 17.9 | 30,841 |
| North Carolina | 12,178 | 2,841 | 81.1 | 18.9 | 15,020 |
| North Dakota | 871 | 232 | 79.0 | 21.0 | 1,102 |
| Northern Mariana Isl | * | * | * | * | * |
| Ohio | 14,178 | 3,039 | 82.3 | 17.7 | 17,217 |
| Oklahoma | 4,662 | 849 | 84.6 | 15.4 | 5,512 |
| Oregon | 5,094 | 1,060 | 82.8 | 17.2 | 6,155 |
| Pennsylvania | 15,377 | 3,312 | 82.3 | 17.7 | 18,689 |
| Puerto Rico | 2,864 | 1,158 | 71.2 | 28.8 | 4,022 |
| Rhode Island | 1,367 | 287 | 82.6 | 17.4 | 1,654 |
| South Carolina | 5,871 | 1,325 | 81.6 | 18.4 | 7,196 |
| South Dakota | 952 | 259 | 78.6 | 21.4 | 1,211 |
| Tennessee | 8,009 | 1,855 | 81.2 | 18.8 | 9,864 |
| Texas | 36,878 | 6,305 | 85.4 | 14.6 | 43,182 |
| Utah | 3,527 | 728 | 82.9 | 17.1 | 4,255 |
| Vermont | 705 | 231 | 75.3 | 24.7 | 937 |
| Virgin Islands | 121 | 10 | 92.4 | 7.6 | 131 |
| Virginia | 10,230 | 2,363 | 81.2 | 18.8 | 12,594 |
| Washington | 9,397 | 1,888 | 83.3 | 16.7 | 11,286 |
| West Virginia | 1,948 | 345 | 84.9 | 15.1 | 2,294 |
| Wisconsin | 6,648 | 1,398 | 82.6 | 17.4 | 8,047 |
| Wyoming | 669 | 178 | 78.9 | 21.1 | 847 |
| Total | 407,652 | 83,237 | 83.0 | 17.0 | 490,888 |

= Rounds to Zero.

* = Data withheld for confidentiality reasons.

Note: Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 36
Connections by Technology by State as of December 31, 2020
(Connections over 200 kbps in at least one direction, in thousands)

| <i>State</i> | <i>ADSL</i> | <i>SDSL</i> | <i>Other Wireline¹</i> | <i>Cable Modem</i> | <i>Fiber</i> | <i>Satellite</i> | <i>Fixed Wireless</i> | <i>Mobile Wireless</i> | <i>Total</i> |
|----------------------|-------------|-------------|-----------------------------------|--------------------|--------------|------------------|-----------------------|------------------------|--------------|
| Alabama | 397 | * | 5 | 949 | 257 | * | 16 | 5,422 | 7,108 |
| Alaska | 66 | # | 7 | * | 13 | * | 13 | 743 | 0 |
| American Samoa | 0 | 0 | 0 | * | * | 0 | * | * | * |
| Arizona | 568 | * | 12 | 1,754 | 181 | * | 63 | 7,588 | 10,205 |
| Arkansas | 323 | * | 2 | 460 | 133 | * | 15 | 3,187 | 4,172 |
| California | 2,229 | 2 | * | 9,293 | 1,527 | * | 202 | 47,224 | 60,686 |
| Colorado | * | # | 18 | 1,534 | 203 | * | 96 | 6,270 | 8,549 |
| Connecticut | * | * | 2 | 1,141 | 43 | * | * | * | 5,556 |
| Delaware | * | * | 2 | 272 | * | * | 1 | * | 1,505 |
| District of Columbia | * | * | 6 | * | * | * | 4 | * | 1,653 |
| Florida | 1,176 | * | 20 | 6,131 | 1,306 | * | 32 | 24,093 | 32,842 |
| Georgia | 792 | * | 10 | 2,197 | 696 | * | 16 | 12,067 | 15,850 |
| Guam | * | 0 | 0 | * | * | 0 | * | * | * |
| Hawaii | * | * | 1 | * | 73 | * | 2 | 1,644 | 2,182 |
| Idaho | 200 | * | 3 | 279 | 55 | * | 66 | 1,811 | 2,432 |
| Illinois | 898 | # | * | 3,153 | 317 | * | 114 | 14,586 | 19,125 |
| Indiana | 494 | * | 3 | 1,377 | 394 | * | 62 | * | 9,256 |
| Iowa | 269 | 1 | * | 511 | 269 | * | 58 | 3,225 | 4,365 |
| Kansas | 196 | # | * | 540 | 256 | * | 51 | 3,070 | 4,133 |
| Kentucky | 341 | * | 2 | 898 | 298 | * | 27 | 4,560 | 6,164 |
| Louisiana | 353 | * | 4 | 923 | 200 | * | 17 | 5,166 | 6,721 |
| Maine | 107 | 1 | * | 471 | 20 | * | 10 | 1,352 | 1,973 |
| Maryland | * | * | 16 | 1,313 | * | * | 8 | 6,950 | 9,252 |
| Massachusetts | * | * | 17 | 2,078 | * | * | 17 | * | 10,466 |
| Michigan | 656 | * | 5 | 2,699 | 184 | * | 65 | 10,805 | 14,502 |
| Minnesota | 440 | 1 | * | 1,308 | 276 | * | 49 | 6,013 | 8,121 |
| Mississippi | 320 | * | 9 | 397 | 105 | * | 16 | 3,164 | 4,076 |
| Missouri | 547 | # | * | 1,113 | 406 | * | 59 | 6,482 | 8,685 |
| Montana | 92 | * | 2 | 244 | 45 | * | 34 | 1,073 | 1,505 |
| Nebraska | 125 | # | * | 403 | 136 | * | 41 | 2,058 | 2,774 |

Figure 36 - Continued
Connections by Technology by State as of December 31, 2020
(Connections over 200 kbps in at least one direction, in thousands)

| <i>State</i> | <i>ADSL</i> | <i>SDSL</i> | <i>Other Wireline¹</i> | <i>Cable Modem</i> | <i>Fiber</i> | <i>Satellite</i> | <i>Fixed Wireless</i> | <i>Mobile Wireless</i> | <i>Total</i> |
|----------------------|---------------|-------------|-----------------------------------|--------------------|---------------|------------------|-----------------------|------------------------|----------------|
| Nevada | 161 | # | 6 | * | 99 | * | 45 | 3,371 | 4,529 |
| New Hampshire | 59 | # | * | 499 | 37 | * | 3 | 1,426 | 2,033 |
| New Jersey | 89 | * | 24 | 2,194 | * | * | 3 | * | 14,093 |
| New Mexico | 223 | * | 4 | 406 | 50 | * | 32 | 2,241 | 2,974 |
| New York | 219 | * | 36 | 5,074 | 1,884 | * | 16 | 23,566 | 30,841 |
| North Carolina | 635 | * | 8 | 2,735 | 606 | * | 24 | 10,935 | 15,020 |
| North Dakota | 29 | * | 1 | 170 | 105 | * | 4 | 792 | 1,102 |
| Northern Mariana Isl | * | * | * | * | * | 0 | * | * | * |
| Ohio | 805 | * | 10 | 3,075 | 424 | * | 71 | * | 17,217 |
| Oklahoma | 305 | # | * | 655 | 222 | * | 68 | 4,208 | 5,512 |
| Oregon | 203 | # | 14 | 1,123 | 211 | 30 | 41 | 4,534 | 6,155 |
| Pennsylvania | 412 | # | * | 3,347 | 1,074 | * | 19 | 13,773 | 18,689 |
| Puerto Rico | * | 0 | * | * | 56 | * | 51 | 3,295 | 4,022 |
| Rhode Island | * | * | * | * | * | * | # | * | 1,654 |
| South Carolina | 354 | * | 3 | 1,233 | 308 | * | 9 | 5,250 | 7,196 |
| South Dakota | 36 | * | 1 | 194 | 78 | * | 12 | 884 | 1,211 |
| Tennessee | 400 | # | * | 1,405 | 579 | * | 23 | 7,395 | 9,864 |
| Texas | 1,648 | # | * | 5,473 | 2,083 | * | 321 | 33,420 | 43,182 |
| Utah | 158 | * | 7 | 603 | 201 | * | 53 | 3,227 | 4,255 |
| Vermont | 78 | * | 3 | 171 | 34 | * | 3 | 641 | 937 |
| Virgin Islands | * | 0 | 0 | * | * | * | * | * | 131 |
| Virginia | 219 | # | * | 1,727 | 1,034 | * | 31 | 9,479 | 12,594 |
| Washington | 371 | # | 45 | 2,146 | 256 | 46 | 53 | 8,369 | 11,286 |
| West Virginia | * | * | 1 | 407 | 16 | * | 7 | 1,670 | 2,294 |
| Wisconsin | 507 | * | 3 | * | 219 | * | 53 | 5,788 | 8,047 |
| Wyoming | 44 | * | 1 | 128 | 15 | * | 36 | 616 | 847 |
| Total | 18,786 | 13 | 527 | 77,909 | 19,945 | 1,931 | 2,140 | 369,638 | 490,888 |

¹ PowerLine and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

= Rounds to Zero.

* = Data withheld for confidentiality reasons.

Note: Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 37
Percentage of Fixed Connections by Downstream Speed by State as of December 31, 2020

| State | % over 200 kbps Downstream | % at least 10 Mbps Downstream | Over 200 kbps Upstream and | | |
|----------------------|-------------------------------|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|
| | | | % at least 25 Mbps Downstream | % at least 100 Mbps Downstream | % at least 940 Mbps Downstream |
| Alabama | 99.8 | 90.3 | 78.9 | 59.4 | 7.9 |
| Alaska | 99.7 | 89.3 | 68.4 | * | * |
| American Samoa | * | * | * | * | * |
| Arizona | 99.8 | 94.5 | 83.1 | 58.5 | 9.5 |
| Arkansas | 99.9 | 88.1 | 71.0 | 41.1 | 7.6 |
| California | 99.8 | 94.6 | 87.0 | 68.2 | 8.3 |
| Colorado | 99.9 | 95.2 | 86.2 | 63.3 | 12.1 |
| Connecticut | 99.7 | 94.7 | 84.3 | 72.9 | 5.5 |
| Delaware | 100.0 | 96.9 | 95.5 | 80.2 | 18.6 |
| District of Columbia | 100.0 | 95.2 | 93.3 | 79.0 | 20.0 |
| Florida | 99.8 | 96.3 | 90.2 | 70.3 | 6.7 |
| Georgia | 99.6 | 92.9 | 84.3 | 63.6 | 12.4 |
| Guam | * | * | * | * | * |
| Hawaii | 100.0 | 95.6 | * | * | * |
| Idaho | 99.9 | 90.2 | 68.4 | 47.9 | 5.0 |
| Illinois | 99.8 | 93.6 | 84.4 | 62.8 | 6.6 |
| Indiana | 99.6 | 91.5 | 80.5 | 58.3 | 7.0 |
| Iowa | 99.5 | 90.0 | 76.7 | 52.5 | 8.0 |
| Kansas | 99.8 | 92.0 | 77.6 | 53.0 | 13.0 |
| Kentucky | 99.7 | 90.4 | 79.9 | 60.2 | 5.3 |
| Louisiana | 99.8 | 91.7 | 79.2 | 55.0 | 8.6 |
| Maine | 99.2 | 88.3 | 75.3 | 63.8 | 1.4 |
| Maryland | 99.9 | 96.5 | 93.9 | 77.8 | 20.9 |
| Massachusetts | 100.0 | 96.5 | 95.0 | 83.6 | 15.4 |
| Michigan | 99.6 | 92.9 | 84.3 | 63.9 | 4.2 |
| Minnesota | 99.9 | 93.0 | 82.4 | 59.5 | 6.4 |
| Mississippi | 99.7 | 86.6 | 68.2 | 41.3 | 9.1 |
| Missouri | 99.7 | 90.5 | 77.3 | 59.7 | 9.9 |
| Montana | 99.9 | 90.1 | 74.6 | 54.6 | 2.1 |
| Nebraska | 99.6 | 93.3 | 80.9 | 59.7 | 7.3 |

Figure 37 - Continued
Percentage of Fixed Connections by Downstream Speed by State as of December 31, 2020

| <i>State</i> | <i>% over 200 kbps Downstream</i> | <i>% at least 10 Mbps Downstream</i> | <i>Over 200 kbps Upstream and</i> | | |
|----------------------|---------------------------------------|--|--|---|---|
| | | | <i>% at least 25 Mbps Downstream</i> | <i>% at least 100 Mbps Downstream</i> | <i>% at least 940 Mbps Downstream</i> |
| Nevada | 99.9 | 96.0 | 87.4 | 64.9 | 10.3 |
| New Hampshire | 99.5 | 93.1 | 88.1 | 78.2 | 7.7 |
| New Jersey | 99.8 | 97.3 | 95.2 | 83.6 | 20.8 |
| New Mexico | 99.9 | 88.6 | 73.6 | 45.0 | 4.3 |
| New York | 99.8 | 97.2 | 92.7 | 82.7 | 13.0 |
| North Carolina | 99.4 | 92.8 | 84.9 | 71.0 | 7.5 |
| North Dakota | 99.9 | 96.7 | 89.1 | 69.8 | 5.5 |
| Northern Mariana Isl | * | * | * | * | * |
| Ohio | 99.8 | 93.1 | 82.0 | 64.7 | 3.2 |
| Oklahoma | 99.7 | 89.5 | 74.8 | 51.2 | 10.6 |
| Oregon | 99.9 | 93.8 | 85.1 | 64.4 | 8.8 |
| Pennsylvania | 99.9 | 93.7 | 89.7 | 71.8 | 13.4 |
| Puerto Rico | 100.0 | 85.6 | 52.9 | 25.1 | 0.7 |
| Rhode Island | 99.6 | 98.5 | 95.7 | 80.3 | 23.3 |
| South Carolina | 99.8 | 93.8 | 84.2 | 68.6 | 5.1 |
| South Dakota | 99.8 | 97.1 | 91.2 | 63.6 | 4.1 |
| Tennessee | 99.7 | 93.7 | 85.3 | 66.1 | 11.0 |
| Texas | 99.9 | 95.0 | 85.5 | 65.6 | 13.4 |
| Utah | 100.0 | 95.1 | 85.1 | 62.6 | 13.4 |
| Vermont | 98.5 | 84.3 | 73.1 | 59.7 | 8.1 |
| Virgin Islands | * | * | * | * | * |
| Virginia | 99.6 | 93.9 | 89.0 | 72.4 | 19.1 |
| Washington | 99.8 | 94.4 | 86.7 | 67.8 | 11.5 |
| West Virginia | 97.9 | 81.1 | 69.3 | 53.4 | 5.5 |
| Wisconsin | 99.3 | 92.2 | 79.4 | 62.4 | 2.7 |
| Wyoming | 99.9 | 92.1 | 79.8 | 53.1 | 1.0 |
| Total | 99.8 | 93.9 | 85.4 | 66.8 | 9.9 |

Source: FCC Form 477.

Figure 38
Providers of Connections by Technology by State as of December 31, 2020
(Connections over 200 kbps in at least one direction, in thousands)

| <i>State</i> | <i>ADSL</i> | <i>SDSL</i> | <i>Other Wireline¹</i> | <i>Cable Modem</i> | <i>Fiber</i> | <i>Satellite</i> | <i>Fixed Wireless</i> | <i>Mobile Wireless</i> | <i>Total</i> |
|----------------------|-------------|-------------|-----------------------------------|--------------------|--------------|------------------|-----------------------|------------------------|--------------|
| Alabama | 23 | * | 15 | 18 | 45 | * | 30 | 6 | 82 |
| Alaska | 17 | 4 | 9 | * | 19 | * | 15 | 10 | 38 |
| American Samoa | 0 | 0 | 0 | * | * | 0 | * | * | * |
| Arizona | 19 | * | 18 | 16 | 50 | * | 53 | 5 | 101 |
| Arkansas | 22 | * | 13 | 17 | 47 | * | 36 | 4 | 90 |
| California | 32 | 12 | * | 32 | 94 | * | 131 | 4 | 222 |
| Colorado | * | 5 | 20 | 16 | 77 | * | 75 | 8 | 139 |
| Connecticut | * | * | 9 | 9 | 22 | * | * | * | 34 |
| Delaware | * | * | 6 | 5 | * | * | 4 | * | 27 |
| District of Columbia | * | * | 12 | * | * | * | 8 | * | 37 |
| Florida | 17 | * | 24 | 18 | 78 | * | 47 | 6 | 121 |
| Georgia | 25 | * | 18 | 26 | 91 | * | 31 | 4 | 121 |
| Guam | * | 0 | 0 | * | * | 0 | * | * | * |
| Hawaii | * | * | 9 | * | 10 | * | 9 | 4 | 20 |
| Idaho | 23 | * | 15 | 16 | 42 | * | 46 | 7 | 77 |
| Illinois | 49 | 5 | * | 21 | 98 | * | 99 | 5 | 185 |
| Indiana | 36 | * | 21 | 12 | 81 | * | 75 | * | 130 |
| Iowa | 71 | 12 | * | 40 | 179 | * | 93 | 6 | 237 |
| Kansas | 27 | 5 | * | 22 | 74 | * | 84 | 8 | 139 |
| Kentucky | 16 | * | 10 | 28 | 60 | * | 36 | 6 | 109 |
| Louisiana | 16 | * | 16 | 15 | 41 | * | 26 | 5 | 75 |
| Maine | 12 | 6 | * | 7 | 20 | * | 19 | 4 | 43 |
| Maryland | * | * | 19 | 16 | * | * | 28 | 4 | 76 |
| Massachusetts | * | * | 12 | 11 | * | * | 21 | * | 60 |
| Michigan | 26 | * | 25 | 26 | 82 | * | 66 | 6 | 140 |
| Minnesota | 38 | 7 | * | 20 | 92 | * | 65 | 4 | 139 |
| Mississippi | 14 | * | 10 | 12 | 37 | * | 16 | 5 | 67 |
| Missouri | 31 | 4 | * | 17 | 76 | * | 87 | 6 | 146 |
| Montana | 19 | * | 12 | 7 | 38 | * | 44 | 6 | 70 |
| Nebraska | 27 | 5 | * | 18 | 63 | * | 54 | 6 | 105 |

Figure 38 - Continued
Providers of Connections by Technology by State as of December 31, 2020
(Connections over 200 kbps in at least one direction, in thousands)

| <i>State</i> | <i>ADSL</i> | <i>SDSL</i> | <i>Other Wireline¹</i> | <i>Cable Modem</i> | <i>Fiber</i> | <i>Satellite</i> | <i>Fixed Wireless</i> | <i>Mobile Wireless</i> | <i>Total</i> |
|----------------------|-------------|-------------|-----------------------------------|--------------------|--------------|------------------|-----------------------|------------------------|--------------|
| Nevada | 17 | 4 | 15 | * | 43 | * | 34 | 4 | 75 |
| New Hampshire | 9 | 4 | * | 5 | 22 | * | 13 | 4 | 37 |
| New Jersey | 8 | * | 20 | 8 | * | * | 11 | * | 63 |
| New Mexico | 18 | * | 14 | 10 | 39 | * | 45 | 5 | 73 |
| New York | 28 | * | 27 | 22 | 80 | * | 31 | 4 | 115 |
| North Carolina | 19 | * | 20 | 27 | 64 | * | 31 | 5 | 102 |
| North Dakota | 18 | * | 9 | 9 | 34 | * | 15 | 5 | 51 |
| Northern Mariana Isl | * | * | * | * | * | 0 | * | * | * |
| Ohio | 32 | * | 25 | 32 | 88 | * | 77 | * | 165 |
| Oklahoma | 33 | 5 | * | 14 | 62 | * | 60 | 9 | 118 |
| Oregon | 32 | 6 | 21 | 18 | 66 | 4 | 51 | 5 | 109 |
| Pennsylvania | 21 | 4 | * | 27 | 71 | * | 39 | 6 | 124 |
| Puerto Rico | * | 0 | * | * | 13 | * | 30 | 4 | 41 |
| Rhode Island | * | * | * | * | * | * | 4 | * | 24 |
| South Carolina | 18 | * | 14 | 14 | 40 | * | 19 | 5 | 62 |
| South Dakota | 20 | * | 11 | 9 | 42 | * | 25 | 7 | 76 |
| Tennessee | 20 | 4 | * | 20 | 84 | * | 36 | 5 | 117 |
| Texas | 62 | 8 | * | 32 | 139 | * | 176 | 8 | 273 |
| Utah | 20 | * | 15 | 11 | 39 | * | 39 | 7 | 70 |
| Vermont | 8 | * | 8 | 5 | 20 | * | 12 | 5 | 36 |
| Virgin Islands | * | 0 | 0 | * | * | * | * | * | 6 |
| Virginia | 19 | 4 | * | 20 | 78 | * | 48 | 5 | 118 |
| Washington | 25 | 5 | 28 | 25 | 75 | 4 | 55 | 5 | 118 |
| West Virginia | * | * | 8 | 16 | 29 | * | 23 | 5 | 66 |
| Wisconsin | 40 | * | 20 | * | 75 | * | 53 | 5 | 116 |
| Wyoming | 14 | * | 9 | 7 | 23 | * | 22 | 7 | 46 |
| Total | 653 | 106 | 209 | 368 | 1,441 | 6 | 1,396 | 64 | 2,381 |

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

= Rounds to Zero.

* = Data withheld for confidentiality reasons.

Note: Numbers may not sum to totals due to rounding.

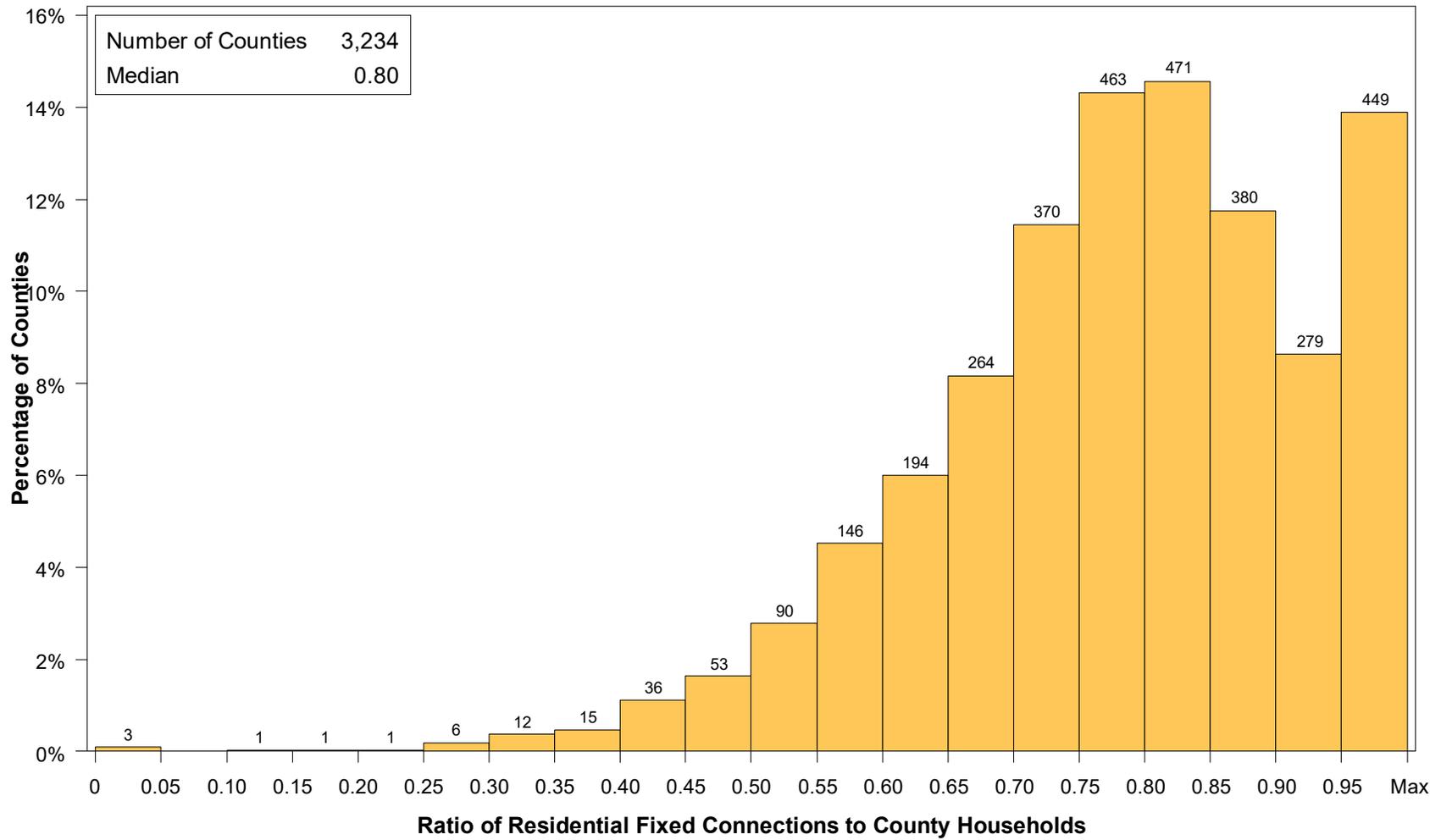
Source: FCC Form 477.

SECTION 4
SUMMARY STATISTICS: COUNTIES AND CENSUS TRACTS

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Figure 39
Distribution of Counties by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households as of December 31, 2020



Note: Ratios over 1 were set to 1. See Technical Notes at the end of the report.
 Sources: FCC Form 477; 2016-2020 ACS 5-year estimates; and Census 2010.

Figure 40
Distribution of Counties by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households by Technology as of December 31, 2020

| <i>Technology</i> | <i>Ratio of Residential Fixed Connections to County Households</i> | | | | | | | | | | <i>100% or more</i> |
|-----------------------------|--|---|--|---|---|---|---|---|---|--|---------------------|
| | <i>Zero</i> | <i>Greater than 0 and no more than 5%</i> | <i>Greater than 5 and no more than 10%</i> | <i>Greater than 10 and no more than 20%</i> | <i>Greater than 20 and no more than 30%</i> | <i>Greater than 30 and no more than 40%</i> | <i>Greater than 40 and no more than 50%</i> | <i>Greater than 50 and no more than 60%</i> | <i>Greater than 60 and no more than 80%</i> | <i>Greater than 80 and no more than 100%</i> | |
| aDSL | 1.9 | 9.6 | 12.9 | 30.7 | 22.6 | 12.5 | 5.4 | 2.3 | 1.7 | 0.3 | 0.1 |
| sDSL | 95.8 | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Wireline ¹ | 82.3 | 17.6 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cable Modem | 11.3 | 5.9 | 5.2 | 11.1 | 12.7 | 11.3 | 11.5 | 11.0 | 16.2 | 2.9 | 0.8 |
| FTTP | 10.3 | 39.7 | 13.5 | 13.5 | 7.8 | 4.6 | 3.3 | 2.4 | 4.1 | 0.6 | 0.1 |
| Satellite | 0.4 | 65.5 | 21.4 | 11.2 | 1.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Fixed Wireless | 3.5 | 65.4 | 15.1 | 10.0 | 3.8 | 1.2 | 0.6 | 0.2 | 0.1 | 0.0 | 0.1 |
| Total | 0.1 | 0.0 | 0.0 | 0.1 | 0.2 | 0.8 | 2.8 | 7.3 | 39.9 | 41.4 | 7.4 |

¹ Power Line and Other are summarized with Other Wireline. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

Note: Numbers may not sum to totals due to rounding.

Sources: FCC Form 477; 2016-2020 ACS 5-year estimates; and Census 2010.

Figure 41
Distribution of Census Tracts by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households as of December 31, 2020

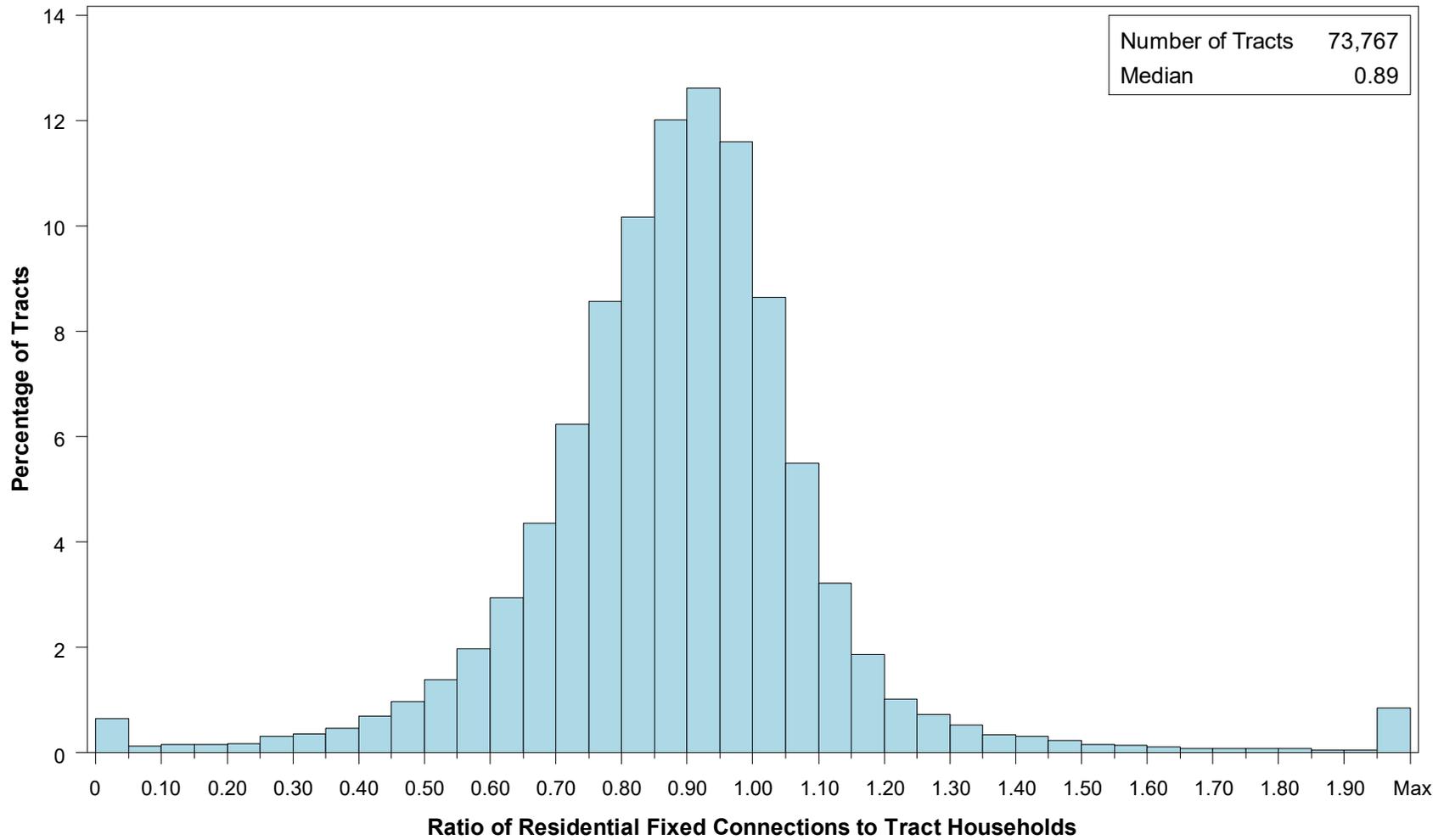


Figure 42
Distribution of Census Tracts by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households by Technology as of December 31, 2020

| <i>Technology</i> | <i>Ratio of Residential Fixed Connections to Tract Households</i> | | | | | | | | | | |
|-----------------------------|---|---|--|---|---|---|---|---|---|--|---------------------|
| | <i>Zero</i> | <i>Greater than 0 and no more than 5%</i> | <i>Greater than 5 and no more than 10%</i> | <i>Greater than 10 and no more than 20%</i> | <i>Greater than 20 and no more than 30%</i> | <i>Greater than 30 and no more than 40%</i> | <i>Greater than 40 and no more than 50%</i> | <i>Greater than 50 and no more than 60%</i> | <i>Greater than 60 and no more than 80%</i> | <i>Greater than 80 and no more than 100%</i> | <i>100% or more</i> |
| aDSL | 5.2 | 28.0 | 16.2 | 24.6 | 15.0 | 5.8 | 2.6 | 1.2 | 0.9 | 0.2 | 0.2 |
| sDSL | 99.4 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Wireline ¹ | 96.9 | 2.9 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cable Modem | 4.3 | 2.6 | 1.5 | 3.2 | 4.3 | 6.8 | 11.8 | 16.5 | 32.2 | 13.2 | 3.6 |
| FTTP | 28.0 | 24.1 | 8.5 | 11.7 | 8.5 | 6.5 | 4.9 | 3.3 | 3.3 | 0.8 | 0.3 |
| Satellite | 28.7 | 61.3 | 5.3 | 3.6 | 0.8 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Fixed Wireless | 31.3 | 60.1 | 3.5 | 2.9 | 1.1 | 0.5 | 0.3 | 0.1 | 0.1 | 0.0 | 0.1 |
| Total | 0.6 | 0.1 | 0.1 | 0.3 | 0.5 | 0.8 | 1.7 | 3.4 | 22.1 | 46.5 | 24.0 |

¹ Power Line and Other are summarized with Other Wireline. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.
 Note: Numbers may not sum to totals due to rounding.
 Sources: FCC Form 477; 2016-2020 ACS 5-year estimates; and Census 2010.

Figure 43
Percentage of Developed Census Blocks with Residential Fixed Service by Technology as of December 31, 2020
(Internet Access Service over 200 kbps in at least one direction)

| <i>Technology</i> | <i>Number of Providers</i> | | | | | | | |
|-------------------------------------|----------------------------|------------|------------|--------------|-------------|-------------|------------|----------------------|
| | <i>Zero</i> | <i>One</i> | <i>Two</i> | <i>Three</i> | <i>Four</i> | <i>Five</i> | <i>Six</i> | <i>Seven or More</i> |
| aDSL | 23.9 | 74.2 | 1.8 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| sDSL | 99.7 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Wireline ¹ | 99.3 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cable Modem | 30.9 | 65.0 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| FTTP | 69.9 | 28.6 | 1.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Satellite | 0.0 | 0.1 | 1.0 | 98.8 | 0.1 | 0.0 | 0.0 | 0.0 |
| Fixed Wireless | 28.3 | 32.9 | 20.8 | 11.1 | 4.8 | 1.6 | 0.4 | 0.2 |
| aDSL and/or Cable Modem and/or FTTP | 9.9 | 24.3 | 56.1 | 9.1 | 0.6 | 0.0 | 0.0 | 0.0 |
| Any Technology | 0.0 | 0.1 | 0.0 | 2.7 | 9.7 | 26.6 | 28.9 | 32.0 |

¹ Power Line and Other are summarized with Other Wireline. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements. Note: Numbers may not sum to totals due to rounding. The number of providers in a census block does not necessarily reflect the number of choices available to a particular household, and does not purport to measure competition. Providers may list a census block on FCC Form 477 if service can be provided to at least one location in the block. Developed census blocks are those with housing units based on the 2010 census. Sources: FCC Form 477 and Census 2010.

Figure 44
Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of December 31, 2020
(Connections over 200 kbps in at least one direction)

| State | Counties | Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households | | | | | | | | | | |
|----------------------|----------|---|------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|--------------|
| | | Zero | Greater than 0 and no more than 5% | Greater than 5 and no more than 10% | Greater than 10 and no more than 20% | Greater than 20 and no more than 30% | Greater than 30 and no more than 40% | Greater than 40 and no more than 50% | Greater than 50 and no more than 60% | Greater than 60 and no more than 80% | Greater than 80 and no more than 100% | 100% or more |
| Alabama | 67 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 11 | 34 | 18 | 1 |
| Alaska | 29 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 4 | 6 | 12 | 5 |
| American Samoa | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| Arizona | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 10 | 0 |
| Arkansas | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 20 | 39 | 11 | 0 |
| California | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 46 | 6 |
| Colorado | 64 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 14 | 25 | 19 |
| Connecticut | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 |
| Delaware | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| District of Columbia | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Florida | 67 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 16 | 25 | 24 |
| Georgia | 159 | 0 | 0 | 0 | 0 | 1 | 3 | 7 | 21 | 60 | 53 | 14 |
| Guam | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Hawaii | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 3 |
| Idaho | 44 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 17 | 16 | 6 |
| Illinois | 102 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 11 | 54 | 33 | 1 |
| Indiana | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 55 | 30 | 1 |
| Iowa | 99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 62 | 36 | 1 |
| Kansas | 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 65 | 36 | 0 |
| Kentucky | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 13 | 58 | 48 | 0 |
| Louisiana | 64 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 15 | 26 | 18 | 0 |
| Maine | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 7 |
| Maryland | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 19 | 2 |
| Massachusetts | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 4 |
| Michigan | 83 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 31 | 43 | 6 |
| Minnesota | 87 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 26 | 57 | 3 |
| Mississippi | 82 | 0 | 0 | 0 | 0 | 0 | 1 | 13 | 23 | 35 | 9 | 1 |
| Missouri | 115 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 12 | 63 | 30 | 3 |
| Montana | 56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 21 | 30 | 4 |
| Nebraska | 93 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 56 | 31 | 0 |

Figure 44 - Continued
Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of December 31, 2020
(Connections over 200 kbps in at least one direction)

| State | Counties | Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households | | | | | | | | | | |
|----------------------|----------|---|------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|-------------------|
| | | Zero | Greater than 0 and no more than 5% | Greater than 5 and no more than 10% | Greater than 10 and no more than 20% | Greater than 20 and no more than 30% | Greater than 30 and no more than 40% | Greater than 40 and no more than 50% | Greater than 50 and no more than 60% | Greater than 60 and no more than 80% | Greater than 80 and no more than 100% | Greater than 100% |
| Nevada | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 5 | 8 | 1 |
| New Hampshire | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| New Jersey | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 17 | 3 |
| New Mexico | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 12 | 13 | 6 |
| New York | 62 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 8 | 43 | 10 |
| North Carolina | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 29 | 52 | 18 |
| North Dakota | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 27 | 3 |
| Northern Mariana Isl | 4 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| Ohio | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 33 | 51 | 2 |
| Oklahoma | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 12 | 46 | 13 | 1 |
| Oregon | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 8 | 21 | 4 |
| Pennsylvania | 67 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 18 | 45 | 3 |
| Puerto Rico | 78 | 0 | 0 | 0 | 0 | 4 | 12 | 17 | 24 | 19 | 2 | 0 |
| Rhode Island | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 |
| South Carolina | 46 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 20 | 18 | 4 |
| South Dakota | 66 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 36 | 26 | 2 |
| Tennessee | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 50 | 37 | 4 |
| Texas | 254 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 14 | 121 | 97 | 17 |
| Utah | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 19 | 8 |
| Vermont | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 6 |
| Virgin Islands | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 |
| Virginia | 134 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 8 | 45 | 62 | 11 |
| Washington | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 10 | 22 | 6 |
| West Virginia | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 34 | 18 | 0 |
| Wisconsin | 72 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 48 | 10 |
| Wyoming | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 15 | 2 |
| Total | 3,234 | 3 | 0 | 0 | 2 | 7 | 27 | 89 | 236 | 1291 | 1339 | 240 |

Note: Numbers may not sum to totals due to rounding. See Technical Notes at the end of the report.

Sources: FCC Form 477; 2016-2020 ACS 5-year estimates (Households for U.S. and District of Columbia); Census 2010 (Households for Puerto Rico, American Samoa, Guam, Northern Mariana Islands and U.S. Virgin Islands).

Figure 45
Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of December 31, 2020
(Connections over 200 kbps in at least one direction)

| State | Tracts | Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households | | | | | | | | | | |
|----------------------|--------|--|------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|--------------|
| | | Zero | Greater than 0 and no more than 5% | Greater than 5 and no more than 10% | Greater than 10 and no more than 20% | Greater than 20 and no more than 30% | Greater than 30 and no more than 40% | Greater than 40 and no more than 50% | Greater than 50 and no more than 60% | Greater than 60 and no more than 80% | Greater than 80 and no more than 100% | 100% or more |
| Alabama | 1,179 | 0 | 0 | 1 | 0 | 3 | 28 | 64 | 106 | 392 | 428 | 157 |
| Alaska | 167 | 1 | 0 | 0 | 2 | 2 | 4 | 5 | 6 | 38 | 72 | 37 |
| American Samoa | 18 | 2 | 0 | 0 | 0 | 0 | 1 | 3 | 5 | 5 | 0 | 2 |
| Arizona | 1,526 | 9 | 2 | 3 | 7 | 15 | 18 | 23 | 46 | 286 | 619 | 498 |
| Arkansas | 686 | 0 | 0 | 0 | 1 | 5 | 13 | 56 | 91 | 268 | 192 | 60 |
| California | 8,036 | 46 | 10 | 3 | 10 | 16 | 32 | 45 | 88 | 997 | 4,519 | 2,270 |
| Colorado | 1,249 | 8 | 0 | 0 | 2 | 1 | 3 | 10 | 20 | 130 | 626 | 449 |
| Connecticut | 829 | 3 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 91 | 478 | 252 |
| Delaware | 215 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 28 | 98 | 85 |
| District of Columbia | 179 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 28 | 85 | 62 |
| Florida | 4,199 | 29 | 4 | 3 | 2 | 5 | 9 | 19 | 73 | 531 | 1,577 | 1,947 |
| Georgia | 1,964 | 6 | 0 | 2 | 2 | 2 | 23 | 43 | 103 | 467 | 782 | 534 |
| Guam | 56 | 8 | 1 | 1 | 3 | 5 | 1 | 2 | 4 | 7 | 8 | 16 |
| Hawaii | 326 | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 33 | 122 | 151 |
| Idaho | 298 | 0 | 0 | 0 | 0 | 3 | 4 | 9 | 12 | 89 | 135 | 46 |
| Illinois | 3,121 | 5 | 0 | 0 | 5 | 7 | 22 | 52 | 132 | 853 | 1,592 | 453 |
| Indiana | 1,508 | 5 | 1 | 0 | 4 | 1 | 11 | 22 | 94 | 503 | 644 | 223 |
| Iowa | 825 | 2 | 0 | 0 | 0 | 1 | 0 | 9 | 20 | 380 | 354 | 59 |
| Kansas | 770 | 6 | 0 | 1 | 2 | 4 | 6 | 5 | 37 | 274 | 313 | 122 |
| Kentucky | 1,115 | 7 | 0 | 2 | 0 | 3 | 10 | 32 | 58 | 348 | 499 | 156 |
| Louisiana | 1,136 | 10 | 1 | 0 | 3 | 12 | 23 | 66 | 93 | 345 | 388 | 195 |
| Maine | 351 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 174 | 131 |
| Maryland | 1,394 | 6 | 1 | 1 | 1 | 2 | 2 | 17 | 16 | 197 | 660 | 491 |
| Massachusetts | 1,471 | 12 | 1 | 1 | 1 | 2 | 4 | 6 | 11 | 168 | 854 | 411 |
| Michigan | 2,767 | 25 | 2 | 4 | 4 | 18 | 29 | 46 | 123 | 687 | 1,329 | 500 |
| Minnesota | 1,335 | 4 | 0 | 0 | 0 | 1 | 5 | 6 | 18 | 330 | 782 | 189 |
| Mississippi | 661 | 4 | 0 | 0 | 0 | 6 | 17 | 64 | 106 | 241 | 162 | 61 |
| Missouri | 1,393 | 2 | 1 | 0 | 2 | 7 | 16 | 54 | 87 | 431 | 579 | 214 |
| Montana | 271 | 1 | 0 | 0 | 0 | 0 | 1 | 4 | 7 | 79 | 131 | 48 |
| Nebraska | 532 | 3 | 1 | 0 | 0 | 1 | 0 | 2 | 16 | 180 | 259 | 70 |

Figure 45 - Continued
Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of December 31, 2020
(Connections over 200 kbps in at least one direction)

| State | Tracts | Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households | | | | | | | | | | |
|----------------------|---------------|--|------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|-------------------|
| | | Zero | Greater than 0 and no more than 5% | Greater than 5 and no more than 10% | Greater than 10 and no more than 20% | Greater than 20 and no more than 30% | Greater than 30 and no more than 40% | Greater than 40 and no more than 50% | Greater than 50 and no more than 60% | Greater than 60 and no more than 80% | Greater than 80 and no more than 100% | Greater than 100% |
| Nevada | 683 | 4 | 0 | 0 | 1 | 0 | 2 | 8 | 17 | 103 | 334 | 214 |
| New Hampshire | 294 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 152 | 129 |
| New Jersey | 2,004 | 9 | 1 | 0 | 8 | 8 | 19 | 12 | 10 | 229 | 962 | 746 |
| New Mexico | 499 | 1 | 1 | 2 | 2 | 7 | 4 | 13 | 24 | 156 | 204 | 85 |
| New York | 4,900 | 68 | 3 | 6 | 15 | 19 | 20 | 33 | 62 | 1,124 | 2,445 | 1,105 |
| North Carolina | 2,183 | 12 | 1 | 0 | 0 | 0 | 3 | 11 | 53 | 505 | 931 | 667 |
| North Dakota | 205 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 80 | 85 | 33 |
| Northern Mariana Isl | 22 | 2 | 0 | 0 | 0 | 1 | 5 | 6 | 1 | 3 | 4 | 0 |
| Ohio | 2,946 | 5 | 0 | 0 | 4 | 6 | 15 | 41 | 102 | 800 | 1,532 | 441 |
| Oklahoma | 1,046 | 0 | 2 | 2 | 3 | 9 | 25 | 51 | 121 | 359 | 330 | 144 |
| Oregon | 827 | 2 | 1 | 0 | 1 | 0 | 1 | 3 | 18 | 135 | 513 | 153 |
| Pennsylvania | 3,217 | 18 | 2 | 3 | 5 | 4 | 16 | 32 | 73 | 717 | 1,702 | 645 |
| Puerto Rico | 903 | 13 | 8 | 46 | 127 | 126 | 127 | 126 | 77 | 84 | 46 | 123 |
| Rhode Island | 241 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 20 | 141 | 77 |
| South Carolina | 1,097 | 9 | 2 | 8 | 2 | 10 | 9 | 28 | 65 | 274 | 401 | 289 |
| South Dakota | 222 | 0 | 0 | 1 | 1 | 0 | 0 | 4 | 7 | 101 | 86 | 22 |
| Tennessee | 1,497 | 12 | 1 | 0 | 2 | 6 | 14 | 28 | 71 | 501 | 629 | 233 |
| Texas | 5,253 | 28 | 2 | 1 | 5 | 14 | 26 | 88 | 233 | 1,445 | 2,125 | 1,286 |
| Utah | 588 | 2 | 2 | 0 | 1 | 3 | 2 | 1 | 3 | 76 | 309 | 189 |
| Vermont | 184 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 13 | 106 | 62 |
| Virgin Islands | 29 | 0 | 0 | 0 | 1 | 0 | 2 | 3 | 0 | 16 | 6 | 1 |
| Virginia | 1,895 | 18 | 2 | 1 | 2 | 7 | 24 | 37 | 74 | 373 | 825 | 532 |
| Washington | 1,446 | 2 | 0 | 1 | 1 | 2 | 4 | 6 | 11 | 150 | 899 | 370 |
| West Virginia | 484 | 0 | 0 | 0 | 2 | 4 | 8 | 24 | 39 | 189 | 171 | 47 |
| Wisconsin | 1,393 | 2 | 2 | 0 | 0 | 1 | 3 | 6 | 22 | 362 | 796 | 199 |
| Wyoming | 132 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 32 | 72 | 23 |
| Total | 73,767 | 426 | 56 | 97 | 236 | 351 | 614 | 1,234 | 2,473 | 16,309 | 34,267 | 17,704 |

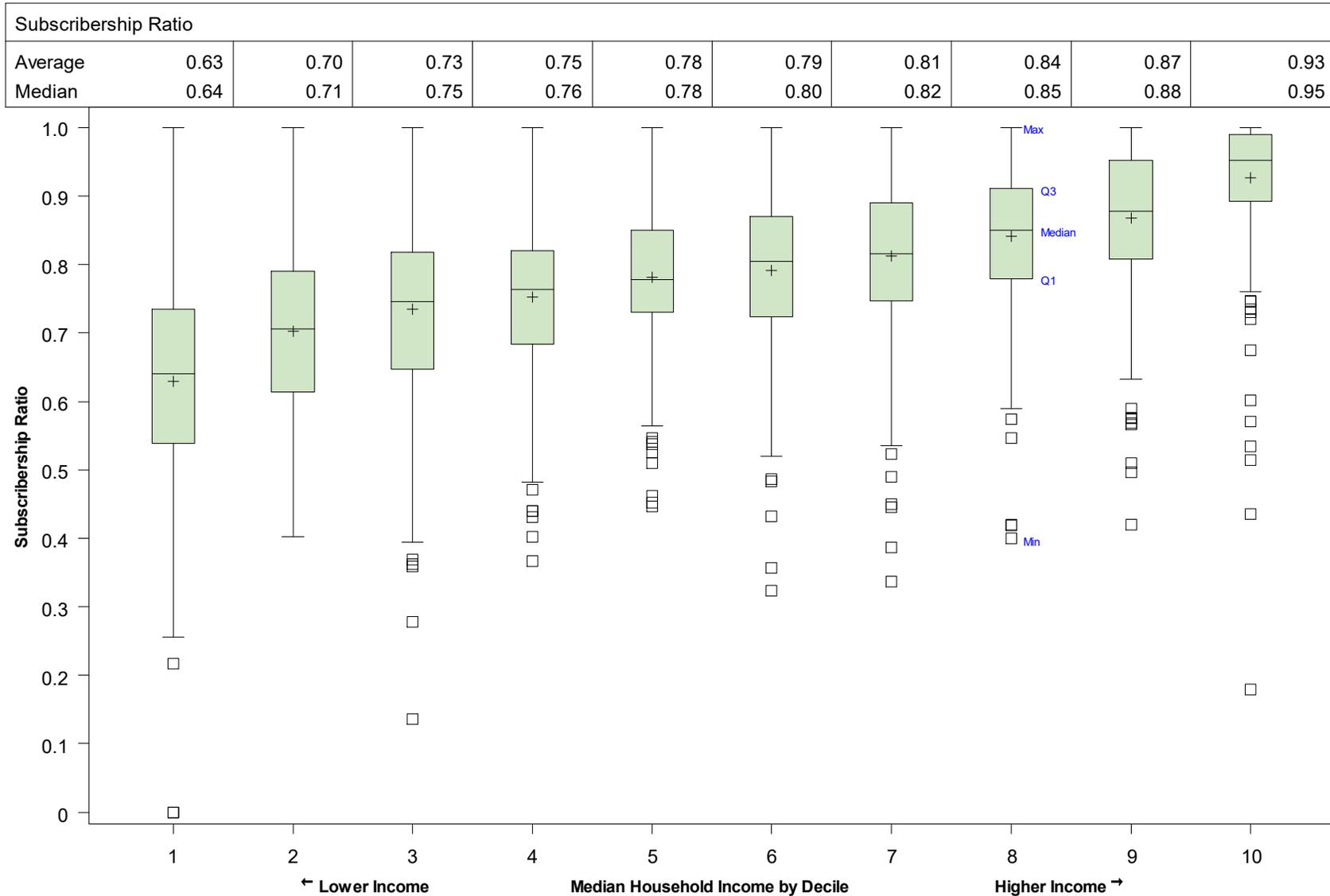
Note: Numbers may not sum to totals due to rounding. See Technical Notes at the end of the report.
Sources: FCC Form 477; 2016-2020 ACS 5-year estimates (Households for U.S. and District of Columbia); Census 2010 (Households for Puerto Rico, American Samoa, Guam, Northern Mariana Islands and U.S. Virgin Islands).

SECTION 5
CORRELATED RESULTS: DEMOGRAPHIC MEASURES

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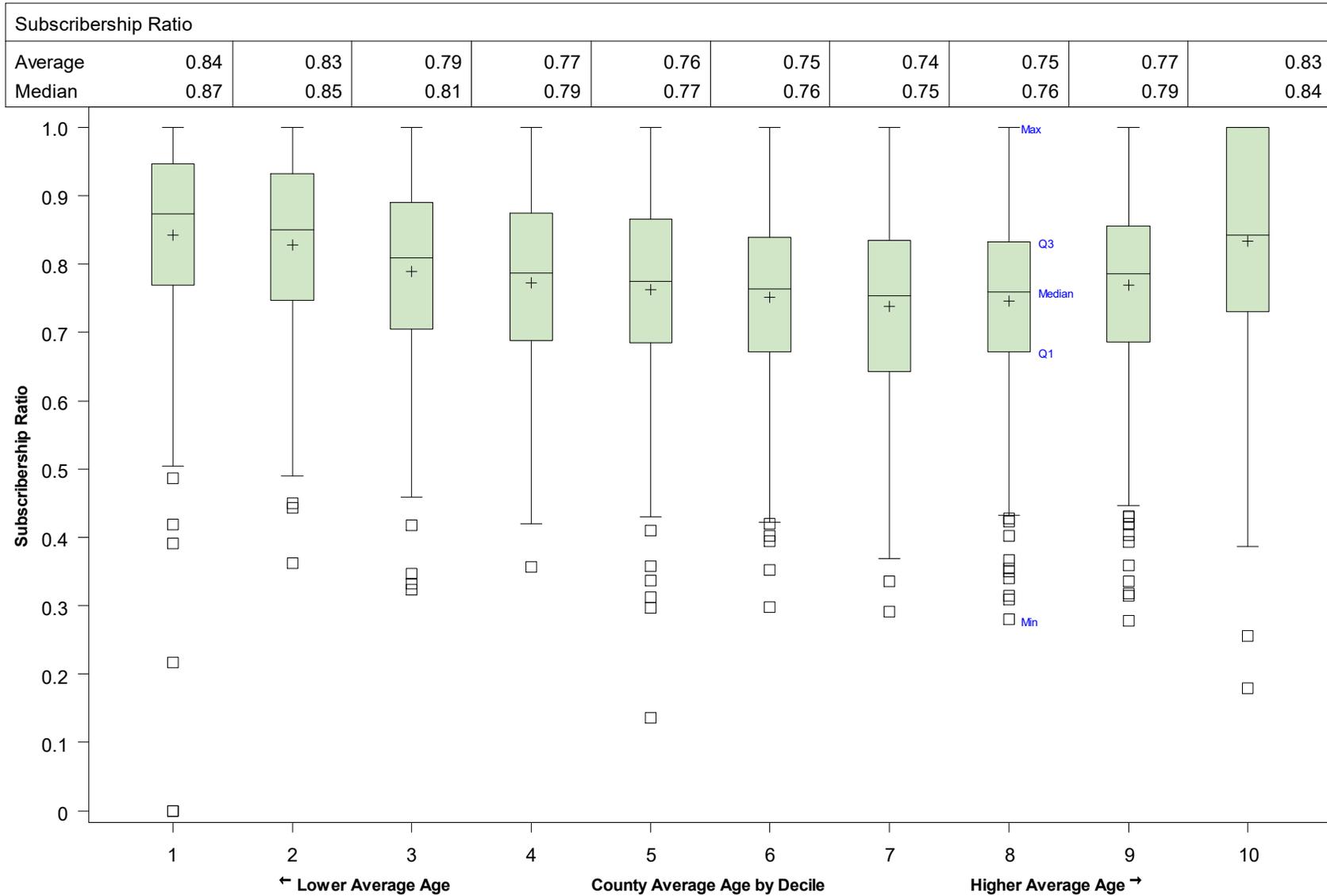
Figure 46
Subscribership Ratio Distributions by Income Deciles as of December 31, 2020



Note: Each box plot shows the distribution of residential subscribership to connections over 200 kbps in at least one direction for counties in the income decile. Some of the features are labeled but note also that + denotes the position of the average residential subscribership ratio taken across all counties in the decile; ⊥ is the minimum observation above Q1-1.5(Q3-Q1); T is the maximum observation below Q3+1.5(Q3-Q1); and □ is any data point beyond Q1-1.5(Q3-Q1) or Q3+1.5(Q3-Q1). Ratios greater than 1 were set to 1.

Sources: FCC Form 477; 2016-2020 ACS 5-year Estimates; Census 2010.

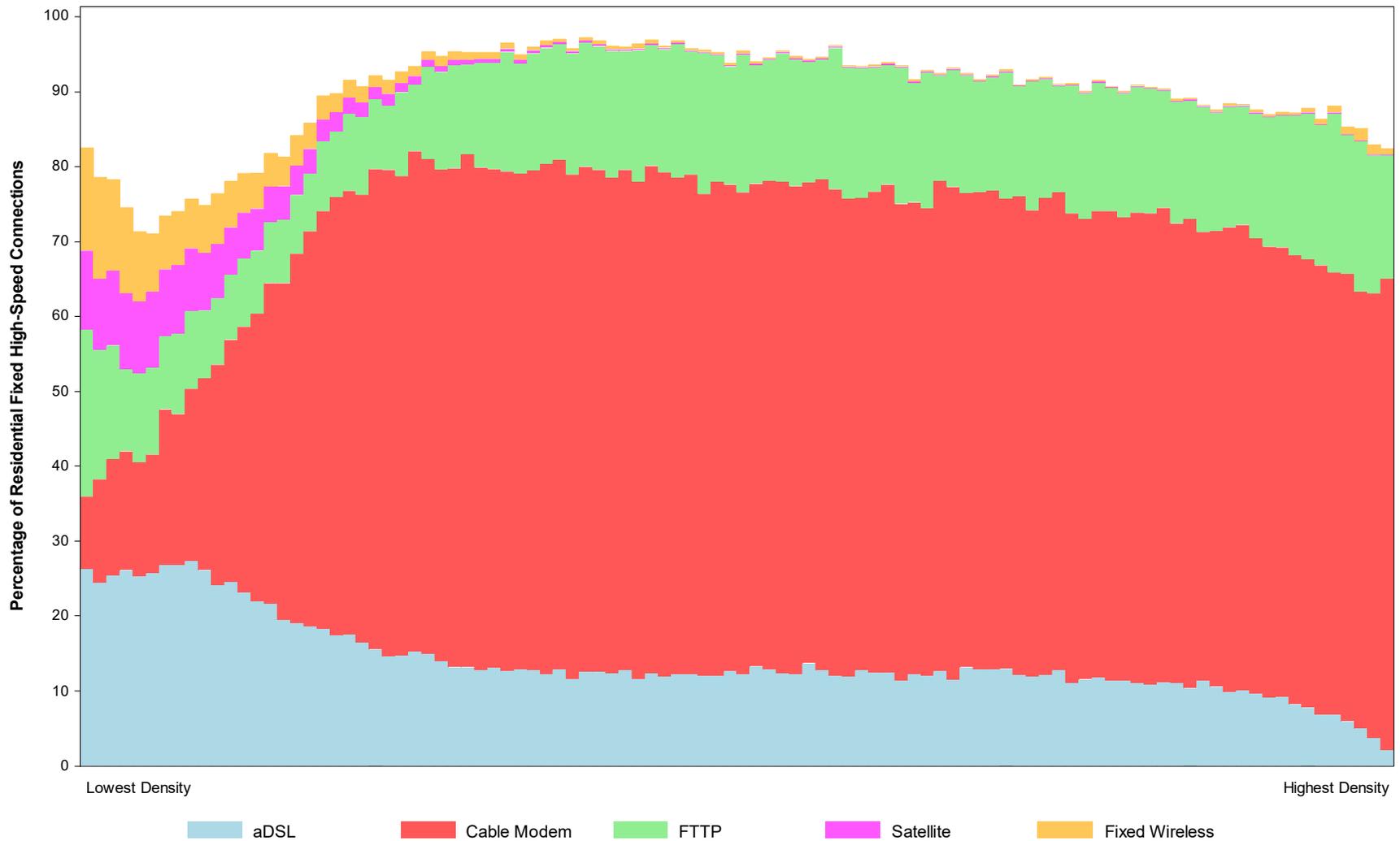
Figure 49
Subscribership Ratio Distributions by Average Age of County Population (in Deciles) as of December 31, 2020



Note: Each box plot shows the distribution of residential subscribership to connections over 200 kbps in at least one direction for counties in the average age decile. Some of the features are labeled but note also that + denotes the position of the average residential subscribership ratio taken across all counties in the decile; ⊥ is the minimum observation above Q1-1.5(Q3-Q1); T is the maximum observation below Q3+1.5(Q3-Q1); and □ is a data point beyond Q1-1.5(Q3-Q1) or Q3+1.5(Q3-Q1). Ratios greater than 1 were set to 1.

Sources: FCC Form 477; 2016-2020 ACS 5-year Estimates; Census 2010.

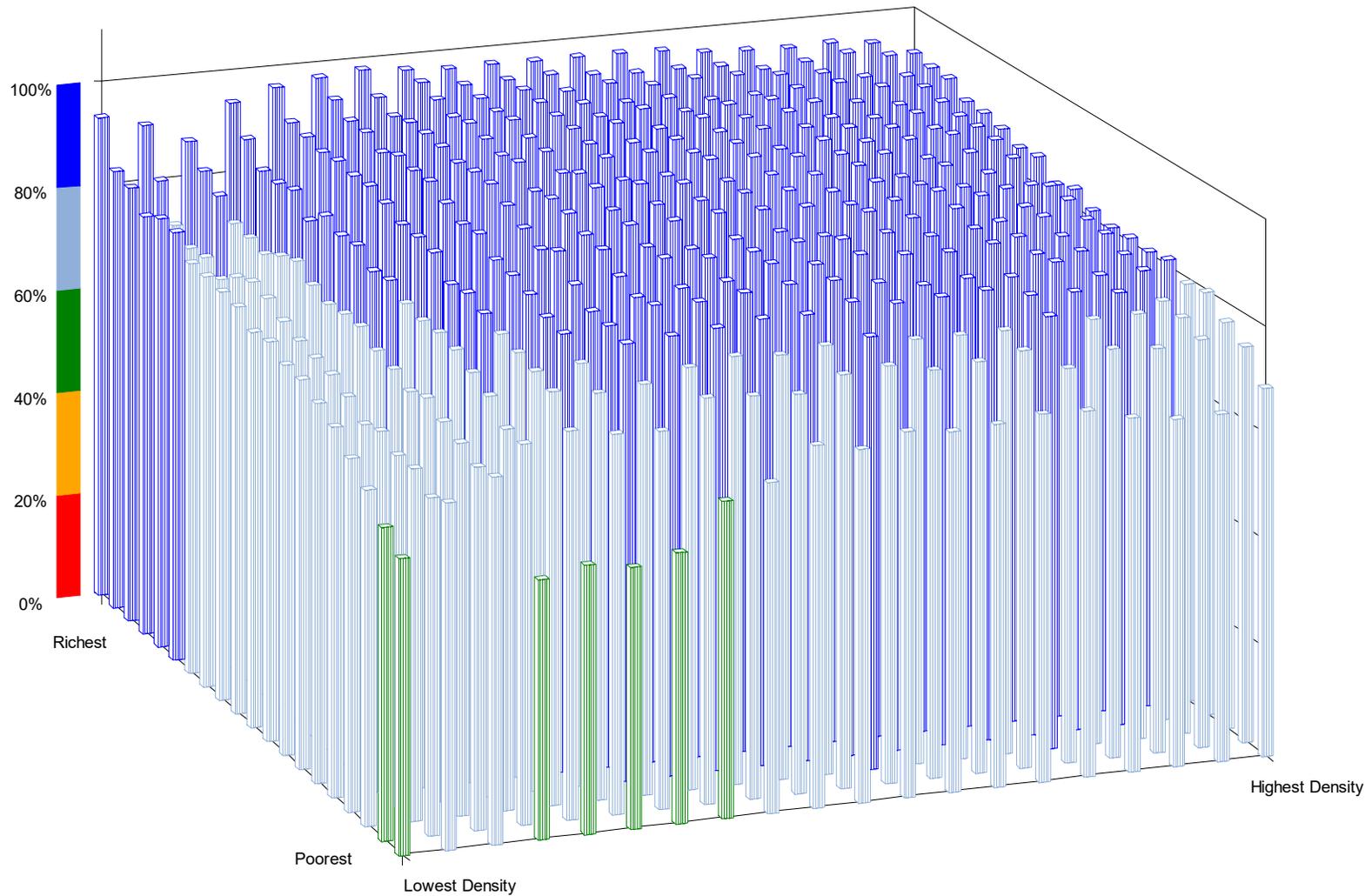
Figure 50
Subscribership Ratios by Technology and Tract Household Density as of December 31, 2020
(Residential fixed connections over 200 kbps in at least one direction)



This chart shows subscribership ratios by technology and household density. Tracts were grouped into 100 density percentiles based on households per square mile, calculated as the ratio of estimated tract households to tract land area from the Census Bureau. For each percentile, the height of the bar represents the household-weighted average ratio of residential fixed connections to households across tracts in the percentile.

Sources: FCC Form 477; 2016-2020 ACS 5-year estimates; and Census 2010.

Figure 51
Average Subscribership Ratios by Income and Household Density as of December 31, 2020
(Residential fixed connections over 200 kbps in at least one direction by Tract)



This chart shows subscribership ratios by household density and income quantiles. Tracts were grouped into 400 density/income quantiles based on households per square mile, calculated as the ratio of estimated tract households to tract land area, and median household income. For each quantile, the height of the grid represents the household-weighted average ratio of residential fixed connections to households across tracts in the decile.

Sources: FCC Form 477; 2016-2020 ACS 5-year estimates; and Census 2010.

Technical Notes

General

The information presented in this report is based on data from FCC Form 477. Through FCC Form 477, facilities-based broadband providers submit information to the FCC about where they offer and have subscribers to Internet access services over 200 kilobits per second (kbps) in at least one direction. In June 2013, the Commission adopted several changes to FCC Form 477.⁹ Detailed information about those changes and about the FCC Form 477 reporting requirements in general is available at www.fcc.gov/form477.

In March 2020, Congress passed the Broadband Data Act which required the Commission to collect broadband availability data at a more granular level than what was historically reported through FCC Form 477.¹⁰ As a result, starting in June 2022, broadband availability data have been collected through the Broadband Data Collection (BDC) while subscription data continues to be reported through FCC Form 477. To ensure consistency across the two data collections, several minor changes were made to the FCC Form 477 reporting requirements beginning with filings as of June 30, 2022. Complete reporting requirements for both, the BDC and FCC Form 477, can be found here: www.fcc.gov/BroadbandData/filers. The inaugural BDC filing window for data as of June 30, 2022 was closed on September 1, 2022. Subscription data collected as part of the BDC will be incorporated into this report beginning with the June 30, 2022 edition.

FCC Form 477 collects information about *Internet access connections in service* to end-user locations that are advertised to deliver information to and/or from the end user – that is, in at least one direction – at transfer rates (speeds) above 200 kilobits per second (kbps). Information is collected about the number of connections by the advertised speeds associated with each product subscribed to in the relevant geographic area, census tracts for fixed and states for mobile. Fixed providers report connections by the maximum advertised upload and download speeds, while mobile providers report connections by minimum advertised upload and download speeds. Fixed connections are further categorized by the technology employed by the part of the connection that terminates at the end-user location. Wherever a *number of providers* is cited in this report, multiple FCC Form 477 filers within a holding company structure count as one provider.

“End users” are residential, business, institutional, or government entities who use services for their own purposes and who do not resell such services to other entities. *Facilities-based providers* report information about connections they provide directly to their own end-user customers and also connections that they provide to Internet Service Providers for resale to end users. For FCC Form 477 purposes, the facilities-based provider of a connection is the entity that owns the portion of the physical facility that terminates at the end-user location, obtains an unbundled network element (UNE), special access line, or other leased facility that terminates at

⁹ *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10, Report and Order, 28 FCC Rcd 9887 (2013). See also *High-Speed Services for Internet Access: Status as of December 31, 2014* (March 2016) at 1-2, available at <https://www.fcc.gov/reports-research/reports/internet-access-services-reports/internet-access-services-reports>.

¹⁰ Broadband Deployment Accuracy and Technological Availability Act, Pub. L. No. 116-130, 134 Stat. 228 (2020) (codified at 47 U.S.C. §§ 641-646) (Broadband DATA Act or Act).

the end-user location and provisions/equips it as a connection that transfers information at rates over 200 kbps in at least one direction, or provisions/equips a wireless channel that transfers information at rates over 200 kbps in at least one direction to the end-user location over licensed spectrum or over spectrum that the provider uses on an unlicensed basis.

The mutually exclusive FCC Form 477 *technology categories* are: asymmetric Digital Subscriber Line (aDSL in this report); symmetric Digital Subscriber Line (sDSL); other copper wireline; cable modem; optical carrier / fiber to the end user; satellite; terrestrial fixed wireless (using licensed or unlicensed spectrum); mobile wireless; and all other (which is included to capture deployment of additional technologies over time). In the FCC Form 477 data collection, aDSL-based services delivered over fiber-to-the-node architecture are reported in the aDSL category. The other wireline category comprises T1/DS1, T3/DS3, and other copper-based connections, not elsewhere categorized, that deliver *Internet access* service at the end-user location. Ethernet connections delivering Internet access service are reported in the other wireline category if the connection terminates over copper and in the FTTP category if the connection terminates over fiber. Connections deployed over hybrid fiber-coax (HFC) architecture are reported in the cable modem category. Wireless ISPs (WISPs) report in the fixed wireless category if providing service to dispersed, fixed end-user locations and report in the mobile wireless category if providing a commercial service that can be received at any location within a service footprint. Wireless local area networks (such as Wi-Fi hotspots) that only enable local distribution and sharing of a premises connection are not included, although the shared premises connection is included.

Numbers of connections presented in this report are not adjusted for the number of persons at a single end-user location who have access to, or who use, the Internet access services delivered over the connection to that location.

Numbers of residential connections are estimated based on the total connections and percentage-residential connections information reported on FCC Form 477.

Census tracts

Since the collection of data as of December 31, 2008, facilities-based providers of reportable fixed-location Internet access connections have been reporting connection counts at the census tract level of detail. Facilities-based mobile wireless providers report connection counts by state rather than census tract.

The census tract-level data summarized in this report were collected for tracts in the 2010 decennial census. For the purposes of this report, there are 73,767 census tracts because we exclude census tracts delineated specifically to cover large bodies of water.

About 110 of the census tracts have population but no households because the population resides in group living quarters. For the purpose of estimating residential subscribership rates by census tract, we assume these census tracts have no reportable *residential* Internet access service because persons residing in group quarters would have Internet access over a business connection provided to the operator of the group quarters. Therefore, these census tracts are included in the “zero” column.

Ratios of residential fixed-location connections to households that exceed 100%

We estimate the share of households with fixed-location connections in individual census tracts by taking the ratio of the reported number of fixed-location residential service connections to the estimated number of households. We continue to find “outlier” estimates at or above 100% and to find that the number of outliers is substantially reduced when estimates are made for individual counties rather than for individual census tracts.

Possible explanations of ratios at or above 100% include: (1) geocoding misallocations of service locations to census tracts; (2) proper allocation of connections to the county level by some filers, but improper allocation of all connections to a single tract in the county; (3) possible overestimation of residential connections in service plans for which the customer base is primarily residential; and (4) connections at seasonally or occasionally occupied housing units, such as vacation homes, while the household is counted elsewhere. The numbers of households in census tracts that were used to generate the estimated ratios are themselves estimates (from Census 2016-2020 ACS 5-year estimates), which could have an independent effect.

Maps showing residential subscribership rates by census tract

The two maps based on estimated Internet access connections over 200 kbps in at least one direction per 1,000 households (that is, estimated household subscribership rates) exclude all connections identified as business connections and necessarily exclude residential mobile wireless connections (which are reported for the state but not for individual census tracts).

Glossary

| Term | Definition |
|---------------------------|--|
| aDSL | Asymmetric Digital Subscriber Line: A digital local loop typically using copper facilities and providing greater bandwidth in one direction than the other. |
| Cable modem service | A service which offers customers access to the Internet over a cable system. |
| Downstream speed | Speed of transmission from the Internet to the end user. |
| End users | Residential, business, institutional, or government entities who use services for their own purposes and who do not resell such services to other entities. |
| Facilities-based provider | Entity that owns the portion of the physical facility that terminates at the end-user location, obtains an unbundled network element (UNE), special access line, or other leased facility that terminates at the end-user location and provisions/equips it as a connection that transfers information at rates over 200 kbps in at least one direction, or provisions/equips a wireless channel that transfers information at rates over 200 kbps in at least one direction to the end-user location over licensed spectrum or over spectrum that the provider uses on an unlicensed basis. |
| Fixed wireless | A radio communication service between specified fixed points. |
| Fixed technologies | All technologies other than terrestrial mobile wireless. |
| FTTH or FTTP | Fiber to the Home (Premises): A network access architecture in which optical fiber is deployed all the way to the customer's home (premises). |
| Internet access service | Service that provides end users access to the Internet. |
| ISPs | Internet Service Providers: Companies or organizations that provide Internet access service (see above). |
| Mobile wireless service | A radio communication service between mobile and fixed stations, or between mobile stations. |
| Mobile wireless provider | Provider of mobile wireless service (see above). |
| Other wireline | All copper-wire based technologies other than DSL technologies; Ethernet over copper and T-1 are examples. |
| Power line | Internet access service delivered over electric power transmission lines. |
| Satellite communications | A telecommunications service provided via one or more satellite relays and their associated uplinks and downlinks. |
| sDSL | Symmetric Digital Subscriber Line: DSL technology that provides equal bandwidth for both uploads and downloads. |
| Speed tiers | Sub-groupings defined by ranges of upstream speeds and downstream speeds. |

| | |
|---------------------------|---|
| Upstream speed | Speed of transmission from the end user to the Internet. |
| Wi-Fi hotspot | Wireless Fidelity: Generic term referring to any type of IEEE 802.11 wireless network. A hotspot is a small geographic area in which users can gain access to a Wi-Fi network which in turn connects to the Internet. |
| Wireless service | Telephone, Internet, data, and other services provided to customers through the transmission of signals over networks of radio towers. |
| Wireless service provider | Provider of wireless service (see above). |
| WISP | Wireless ISP: A company that provides end users with wireless access to the Internet, most commonly by using radio spectrum designated for unlicensed use. |